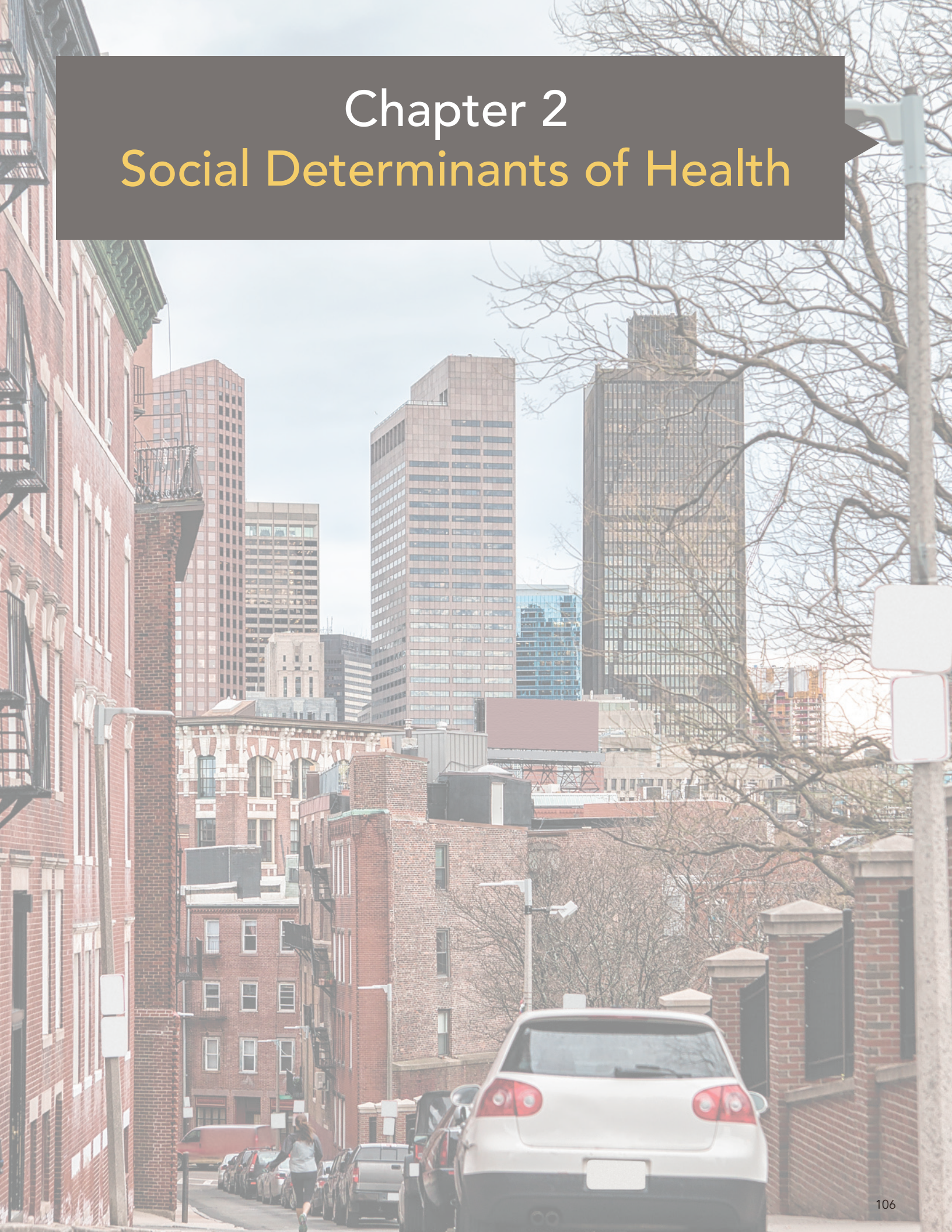
Chapter 2
Social Determinants of Health



Social Determinants of Health

Beyond individual physiology and health-related behaviors, there are economic, environmental, and social factors that influence health. Collectively, we refer to these as social determinants of health. Social determinants are societal circumstances in which people are born, grow up, live, work, and age (1). Social determinants of health are uniquely experienced by individuals, differentially impacting health experiences and ultimately contributing to health inequities (2). Research has identified a wide range of social factors that are associated with differences in health outcomes (2):

- Access to health care
- Access to health resources
- Access to healthy food
- Education
- Employment and occupational safety
- Environmental safety
- Exposure to violence
- Housing conditions
- Income
- Insurance coverage
- Racism and discrimination
- Transportation

These social determinants of health impact an individual's life in many ways, for example, shaping the quality of education available to them, their ability to find and maintain employment and the type of work available (including levels of exposure to occupational hazards), their access to safe and stable housing, and their access to health care and the quality of those services (3). The resulting life experiences, in turn, directly influence physical and mental health and contribute to health inequities. Our report describes how many health-promoting resources, such as income, employment, education, and home ownership, are unevenly distributed within our city among those of differing races and ethnicities, socioeconomic status, and geographic locations. Social determinants of health can be described in terms of three broad context areas: economic, environmental, and social.

Economic conditions and health

Economic factors that influence health occur on both community and individual levels. On the community level, economic factors believed to be associated with health outcomes include income, poverty rates, employment opportunities, community investment, tax base, and spending priorities for local tax dollars (2). On an individual level, the opportunity to obtain a meaningful job with few occupational hazards, address financial needs, and remain food secure are paramount to maintaining good health. Economic resources enable health purchasing power including the ability to attain resources to manage or control disease (4). Lack of economic opportunity can create a vicious cycle where children who grow up in poverty are less able to acquire the needed resources for health and are more likely to experience mental, emotional, and behavioral disorders as a result (5).

The effects of coping with daily economic hardship can trigger a physical response, which may damage immune defense, deregulate physical processes, and accelerate aging or the onset of chronic disease (6, 7).

Quality education is widely recognized as a leading influence of acquiring higher economic position and better health. Educational attainment is associated with improved working conditions and higher income, which in turn allows for improved housing, nutrition, control of hazards and stress, as well as direct health benefits from having quality health insurance, retirement benefits, and adequate sick leave (8). Educational attainment is also closely linked to improved health knowledge, literacy, and behaviors, all of which are associated with improved health awareness and disease management (8).

Environmental conditions and health

The "built environment" or physical structures and infrastructure of communities and homes, can profoundly impact the safety and lifestyle options of its residents (9). Neighborhood safety, desirable areas for physical activity, close proximity to providers of affordable and nutrient-dense foods such as fruits and vegetables, clean air, access to formal health services, transportation options, and affordable housing are all essential to helping individuals attain full and vibrant health. Conversely, a density of retailers selling tobacco and alcohol, the presence of deserted and rundown lots, and industrial pollution serve to diminish safety and health (1, 8).

Physical inactivity, which increases the risk of diabetes, high blood pressure, and obesity, can be spurred by environmental conditions that produce fear and concern of victimization such as the presence of crime, or by a lack of well-kept sidewalks and walkability in neighborhoods (10). Children living in such physical environments are more likely to become overweight and obese (11). Communities with fewer physical assets and less desirable living conditions experience poorer overall health, including higher levels of depression, infant mortality, low birthweight, child maltreatment, and homicide rates (12). The built environment serves to mediate an individual's perceptions about the health opportunities available to them, their ability and likelihood of engaging in healthy behaviors, and their ability to buffer toxic and stressful exposures.

Social conditions and health

Social conditions encompass the relationships, family structure, and cultural dynamics within which defined groups of people function and interact (13, 14). The "acceptability" or "norms" for positive behaviors can also be developed within these networks, and may influence health-related behaviors (15). Social conditions also include social capital, which refers to the individual and communal time and energy available for community improvement, social networking, civic engagement, and other activities that create social bonds between individuals and groups (16). Social capital can be formed through an individual's level of trust and sharing within communities, while dense social networks and civic engagement provide structure for social capital (17). The presence of social capital, support, trust, and reciprocity have been associated with improved overall psychological well-being and improved perceptions of personal health (18).

Social conditions also encompass perceptions of community members about their social surroundings. Crime rates, housing patterns, and law enforcement policies can all influence a person's perceptions of the value and safety of their social environment, as well as their tendency to engage positively in their community (2). When social relationships or conditions breed an environment of fear, suspicion, discrimination, or racism, a chronic stress response may occur (19, 20). Chronic stress can create long-term elevation in stress hormones, implicated in the development of anxiety, depression, digestive problems, heart disease, sleep problems, weight gain, and problems with memory and concentration (21). Encouragingly, however, positive social ties tend to naturally reduce the negative effects of stress in a person's life by encouraging more healthful behaviors and "buffering" stressful influences (22, 23).

Education

Education is a very general term used to refer to the experience or result of learning undertaken primarily in institutional settings, such as schools and colleges (24). The number of years of schooling is often used as a measure of education, and is associated with income status.

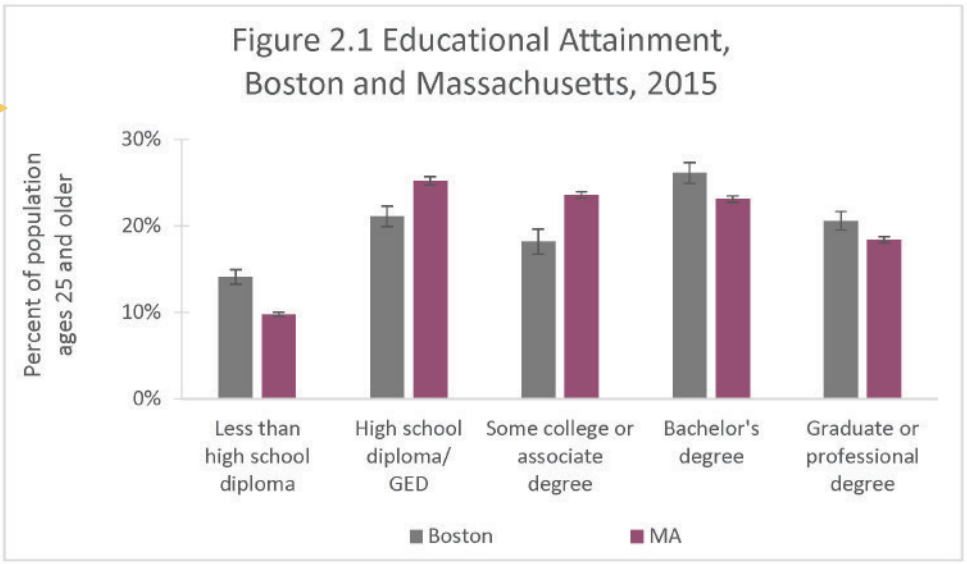
Education is associated with health in many ways. Higher educational attainment is associated with improved working conditions and income, which in turn allows for improved housing, nutrition, control of hazards and stress, as well as direct health benefits, including quality health insurance, retirement benefits, and sick leave (8). Educational attainment is also closely linked to improved health knowledge, literacy, and behaviors, which are, in turn, associated with improved disease management (8). Individuals with more years of formal education tend to have healthier behaviors and better health outcomes. Education also helps promote and sustain healthy lifestyles and positive choices that support and nurture personal development, relationships, and community well-being (25). Although educational attainment is associated with adult socioeconomic status (SES), many studies suggest that schooling has an important effect on health, independent of SES (26). Additionally, parental level of educational attainment is a significant predictor of child health, with children of more highly educated parents having better overall health than children with less educated parents (27).

Access to technology has been shown to impact health as well. The internet is a popular platform for health education, and inequities in computer and internet access mirror inequities in health (28). U.S. adults from households earning less than $30,000 a year are roughly eight times more likely than the most affluent adults to not use the internet (29). This section presents data on educational attainment and related indicators, and the association between selected health indicators and educational attainment.

A comparison of educational attainment between Boston and Massachusetts residents ages 25 and older in 2015 demonstrates that a higher percentage of Boston residents can be found at both the high and low ends of educational attainment, while a higher percentage of Massachusetts residents can be found in the middle.

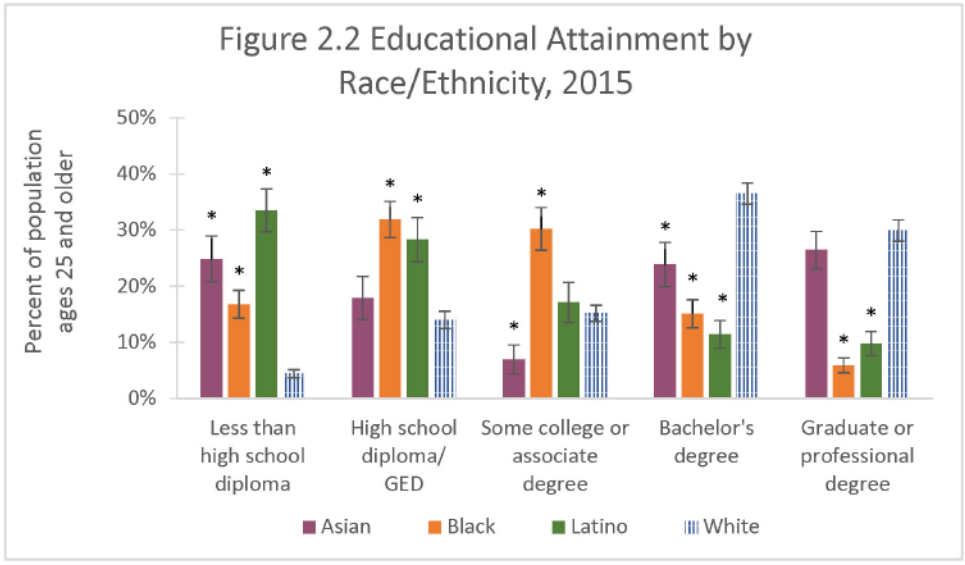
At the high end of educational attainment, 21% and 26% of Boston residents had a graduate/professional degree or a bachelor's degree, respectively, compared with 18% and 23% of Massachusetts residents. At the low end of educational attainment, 14% of Boston residents had less than a high school diploma compared with 10% of Massachusetts residents.

In the middle range of educational attainment, 24% and 25% of Massachusetts residents had some college education an associate degree or a high school diploma/GED, respectively, compared with 18% and 21% of Boston residents.



DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

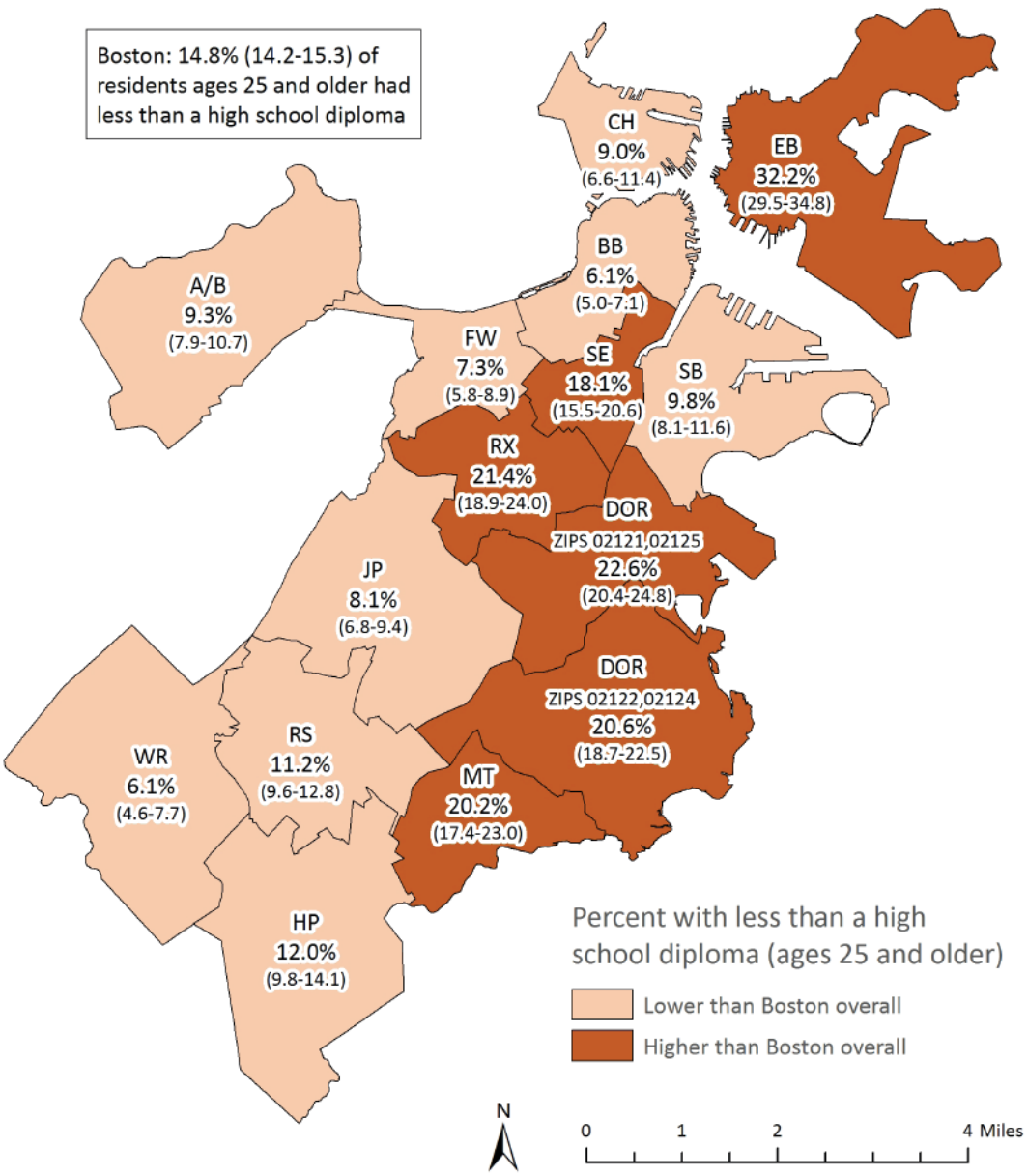
In 2015, lower percentages of Asian (24%), Black (15%), and Latino (11%) Boston residents ages 25 and older had a bachelor's degree compared with White residents (37%). Higher percentages of Asian (25%), Black (17%), and Latino (34%) residents had less than a high school diploma compared with White residents (4%).



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator. Due to limited data availability, data for Asian residents includes individuals who identified as Latino (less than 1% of Asian residents identified as Latino).
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

Figure 2.3 Residents With Less Than a High School Diploma by Neighborhood, 2011-2015

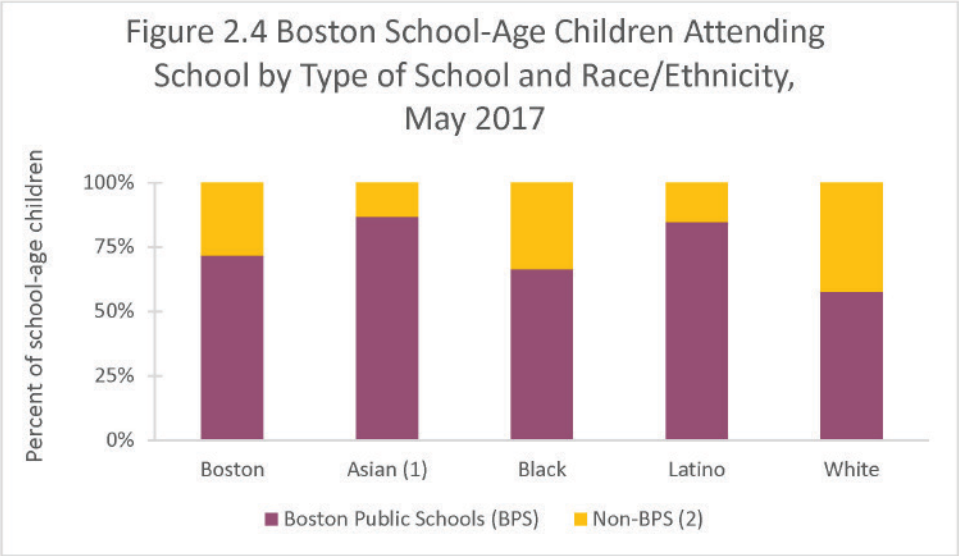


NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End. "SE" includes the South End and Chinatown.

DATA SOURCE: American Community Survey, 2011-2015, U.S. Census Bureau

During 2011-2015, higher percentages of residents ages 25 and older in Dorchester (zip codes 02121, 02125), Dorchester (zip codes 02122, 02124), East Boston, Mattapan, Roxbury, and the South End had less than a high school diploma compared with Boston overall. Lower percentages of residents in Allston/Brighton, Back Bay, Charlestown, Fenway, Hyde Park, Jamaica Plain, Roslindale, South Boston, and West Roxbury had less than a high school diploma compared with Boston overall.

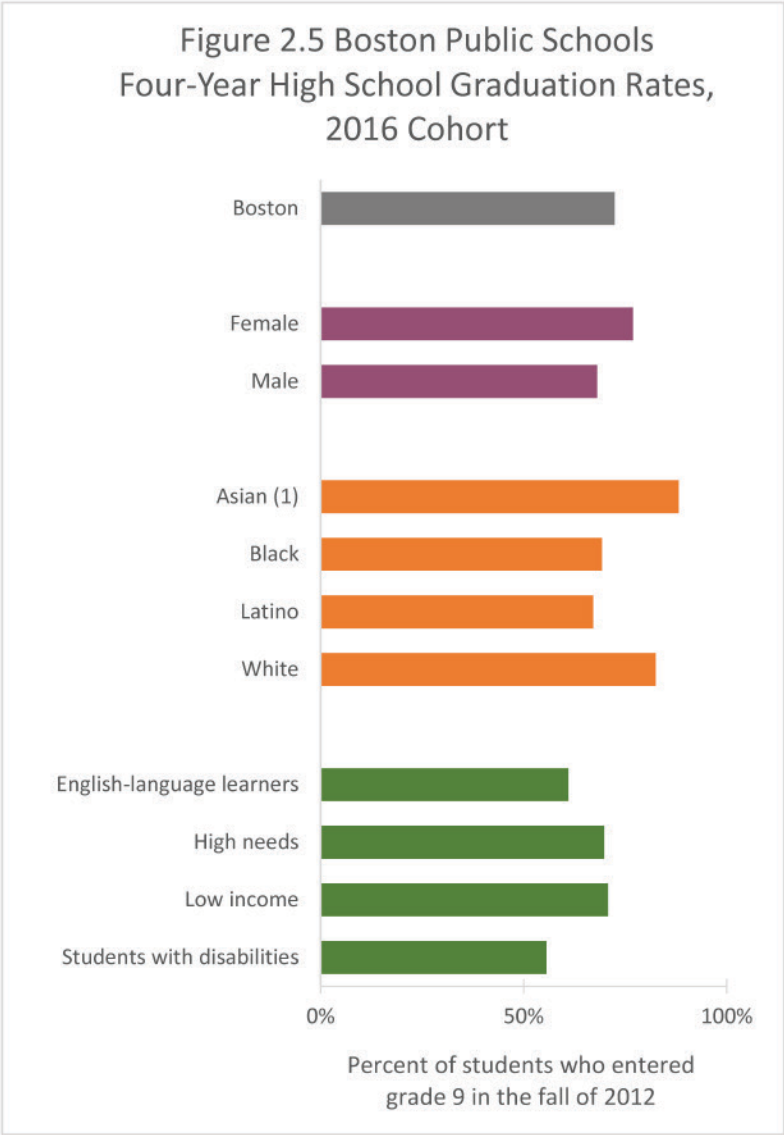
Seventy-two percent of Boston school-age children attended Boston Public Schools. Most Asian (87%) and Latino (85%) children attended Boston Public Schools. In comparison, only 58% of White children attended Boston Public Schools.



(1) Does not include Native Hawaiians/Other Pacific Islanders
(2) Includes public charter schools (not operated by BPS), parochial schools, private schools, suburban schools through Metropolitan Council for Educational Opportunity (METCO), home schooling, and placement in non-BPS schools and programs by the BPS Special Education Department

DATA SOURCE: Office of Data and Accountability, Boston Public Schools

Figure 2.5 Boston Public Schools Four-Year High School Graduation Rates, 2016 Cohort



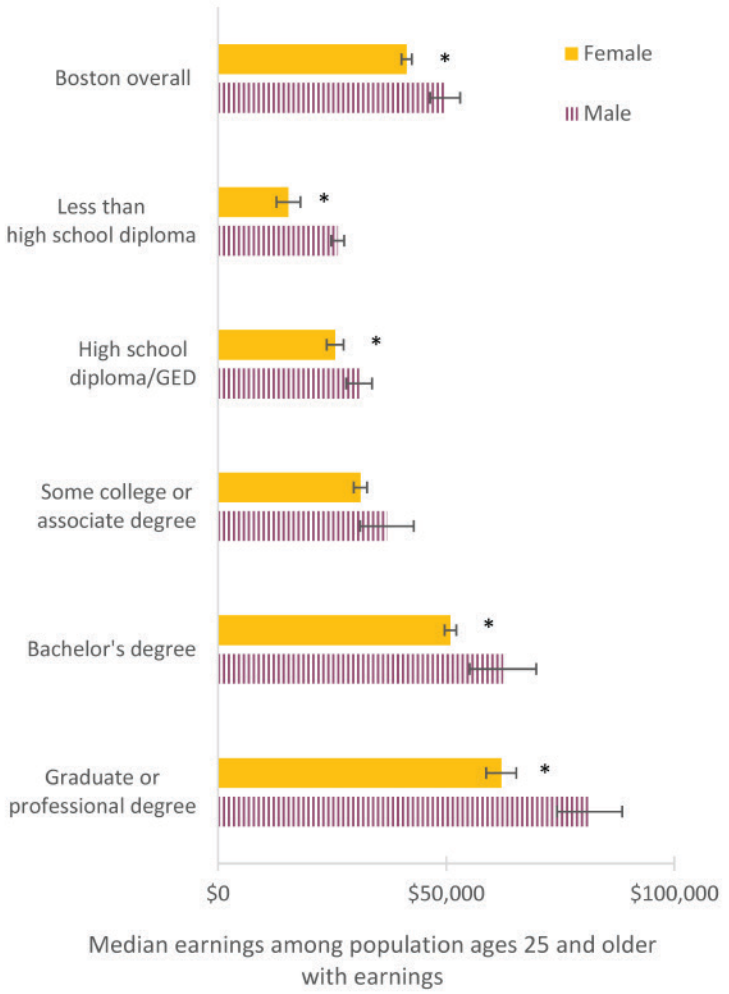
(1) Does not include Native Hawaiians/Other Pacific Islanders

NOTE: Five-year graduation rates were unavailable.
DATA SOURCE: Office of Data and Accountability, Boston Public Schools

Seventy-two percent of students attending Boston Public Schools who entered grade 9 in the fall of 2012 graduated in four years. Seventy-seven percent of female students graduated in 4 years compared with 68% of male students. Among the racial/ethnic groups presented, 4-year graduation rates were highest for Asian students (88%) and lowest for Latino students (67%). Additionally, 61% of English-language learners, 70% of high-needs students, 71% of low-income students, and 56% of students with disabilities graduated in 4 years.

In 2015, the median earnings for Boston residents ages 25 and older varied by educational attainment and sex. For males and females, median earnings increased as the level of educational attainment increased. Females at all levels of educational attainment, except those with some college an associate degree, had lower median earnings when compared with their male counterparts. The largest discrepancy was observed among residents with graduate or professional degrees. Females with these degrees had median earnings of $62,056 while males had median earnings of $81,428.

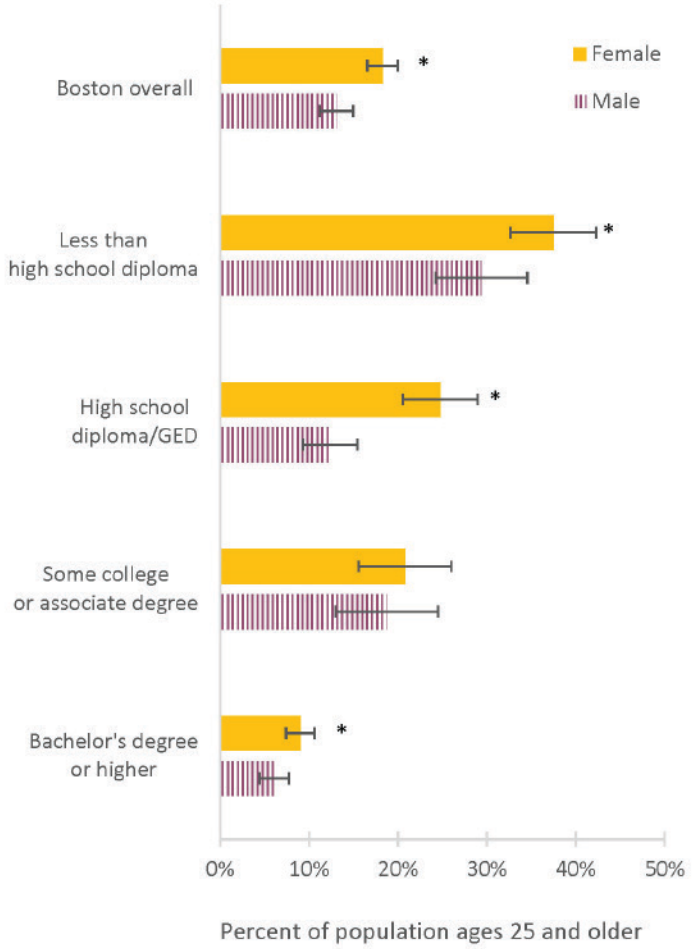
Figure 2.6 Median Earnings by Educational Attainment and Sex, 2015



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator. Median earnings were for the past 12 months.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

Figure 2.7 Population Living Below Poverty Level by Educational Attainment and Sex, 2015



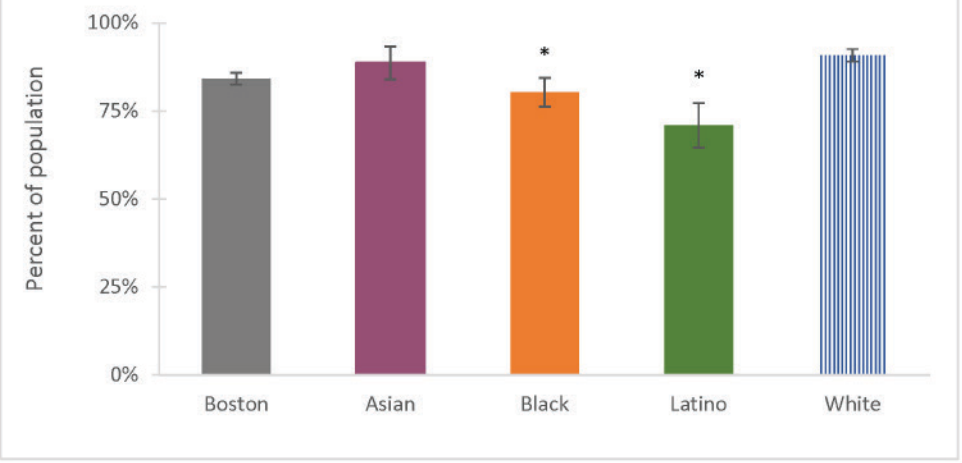
* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator. Poverty status was determined for the past 12 months for all people except institutionalized people, people in military group quarters, people in college dormitories, and unrelated individuals under 15 years old.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

In 2015, the percentage of Boston residents ages 25 and older living below the poverty level varied by educational attainment and sex. Compared with males, higher percentages of females at all levels of educational attainment, except those with some college an associate degree, were living below the poverty level.

In 2015, 84% of Boston residents had access to a laptop, desktop, or notebook computer. A lower percentage of Black (80%) and Latino (71%) residents had computer access compared with White residents (91%).

Figure 2.8 Computer Access by Race/Ethnicity, 2015

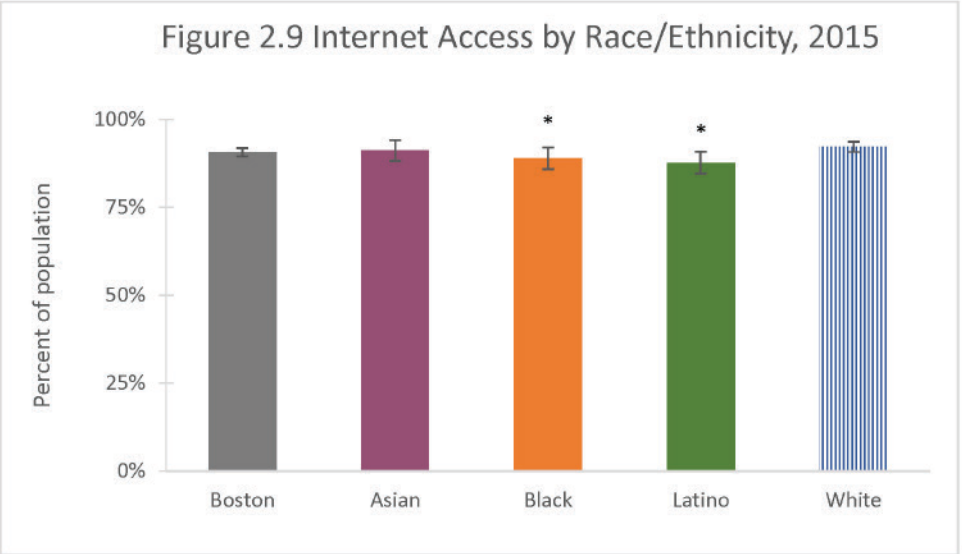


* Statistically significant difference when comparisons are made between racial/ethnic groups

NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 91% of residents had internet access at home. A lower percentage of Black (89%) and Latino (88%) residents had internet access compared with White residents (92%).

Figure 2.9 Internet Access by Race/Ethnicity, 2015



* Statistically significant difference when comparisons are made between racial/ethnic groups

NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

Figure 2.10 Health Indicators by Educational Attainment, 2015

	<HS diploma	HS diploma	Some college+
Asthma	19.7%* (14.3-26.4)	9.7% (7.0-13.3)	10.9% (9.1-13.1)
Diabetes	18.1%* (13.3-24.0)	10.8%* (8.6-13.4)	5.5% (4.6-6.5)
Hypertension	38.7%* (31.8-46.1)	29.5%* (25.2-34.3)	20.4% (18.4-22.5)
Obesity	32.7%* (25.6-40.7)	27.6%* (22.8-32.9)	18.2% (16.1-20.6)
Persistent anxiety	23.9% (17.7-31.3)	22.0% (17.5-27.2)	21.4% (18.8-24.3)
Persistent sadness	22.8%* (16.8-30.1)	15.0%* (11.6-19.2)	8.5% (7.0-10.3)

* Statistically significant difference when compared to reference group (Some college+)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

This table describes select health indicators by educational attainment. A higher percentage of adults with less than a high school diploma had asthma, diabetes, hypertension, obesity and persistent sadness compared with adults with at least some college education. Percentages of asthma and persistent sadness remained higher after adjusting for age, race/ethnicity, and sex (adjusted data not shown). For diabetes, hypertension, and obesity, however, the differences were no longer evident after adjusting for age, race/ethnicity, and sex.

Similarly, a higher percentage of adults with a high school diploma had diabetes, hypertension, obesity, and persistent sadness compared with adults with some college education. These percentages remain higher even after adjusting for age, race/ethnicity, and sex (adjusted data not shown).

Education Summary

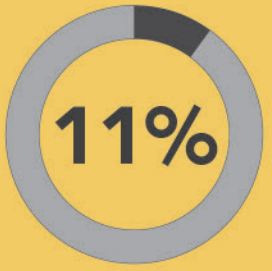
Although Boston has a reputation as an education hub, sex and racial/ethnic inequities for residents in educational attainment and related indicators exist. A higher percentage of White residents had a bachelor's degree compared with Black, Latino, and Asian residents, and a lower percentage of White residents compared with Black, Latino, and Asian residents had less than a high school diploma. At the neighborhood level, we found higher percentages of residents with less than a high school diploma in Dorchester (zip codes 02121, 02125), Dorchester (zip codes 02122, 02124), East Boston, Mattapan, Roxbury, and the South End. Inequities across categories of race/ethnicity were also reflected in the attendance and graduation rates of Boston Public Schools (BPS), and access to technology. A lower percentage of White school-age children attended Boston Public Schools (versus other types of schools) compared with Asian, Black, and Latino school-age children. A higher percentage of White and Asian BPS high school students graduated in four years compared with Black and Latino students. Black and Latino residents were also less likely to have access to a computer or to have internet access at home compared with White residents.

Inequities in educational attainment and related indicators across sex were found for BPS high school graduation rates, wage earnings, and income below poverty. A higher percentage of female BPS students graduated high school in four years compared with male students. Later in life, however, women's earnings were less compared with men, regardless of education. Similarly, across most categories of educational attainment, women were more likely than men to live below the poverty level.

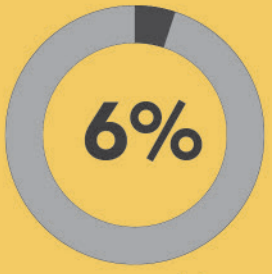
After adjusting for age, race/ethnicity, and sex, we observed that lower educational attainment was associated with higher percentages of adverse health indicators. In comparison with adults with at least some college education, adults with less than a high school diploma had higher percentages of asthma and persistent sadness. Adult residents with a high school diploma had higher percentages of diabetes, hypertension, obesity, and persistent sadness.

Educational attainment and chronic conditions in 2015:

Diabetes:



among residents with a high school (HS) diploma



among residents with at least some college

Obesity:

28% among residents with a HS diploma

18% among residents with at least some college

Hypertension:

30% among residents with a HS diploma

20% among residents with at least some college

Persistent sadness:

15% among residents with a HS diploma

9% among residents with at least some college

Health of Boston 2016-2017

Employment

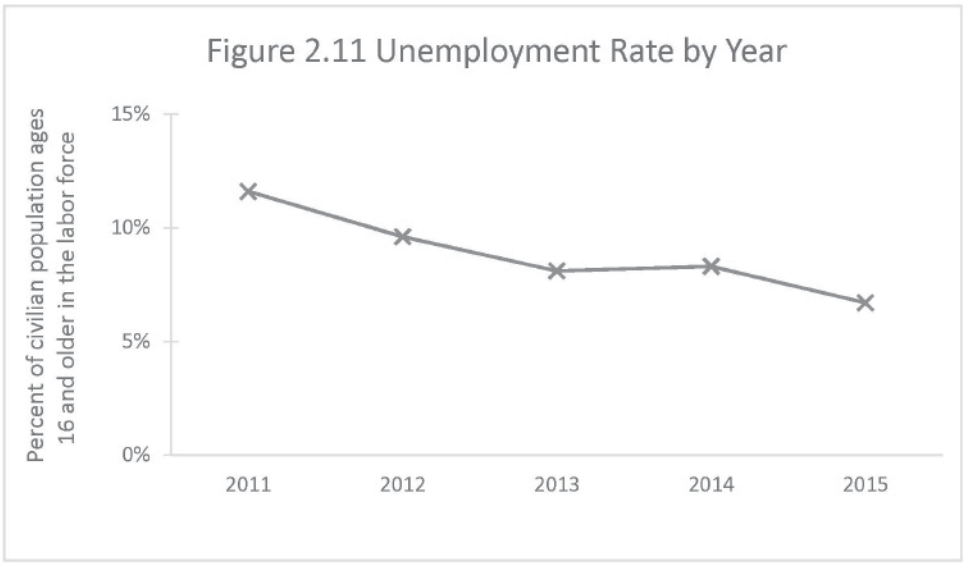
On average, full-time employed persons in the U.S. spend more than half of their waking hours on weekdays doing work and work-related activities (30). For millions of Americans, a stable job in safe working conditions provides benefits critical to maintaining good health, such as income, health insurance, and stability (31).

Employment is associated with income and is part of an individual's and community's socioeconomic status. Being employed makes it easier for individuals to live in healthy neighborhoods, provide quality education for their children, and secure child care services, housing, and healthy foods (31).

The unemployment rate is the most frequently cited employment statistic. The U.S. Census counts as unemployed those who are ages 16 and older who are not working, but are actively looking for and available to start work. Employed individuals include both those who work full-time (35 or more hours) and those who work part-time (1 to 34 hours). Unemployed Americans face numerous health challenges beyond loss of income. It has been well documented that perceived health (i.e. self-reported excellent, good, or poor health) and physical functioning decrease with age. However, research indicates that these declines are more gradual among individuals with full-time employment (32). In terms of mental health, a 2010 Gallup Poll found that unemployed Americans were more likely than employed Americans to be diagnosed with depression and report feelings of sadness and worry (31).

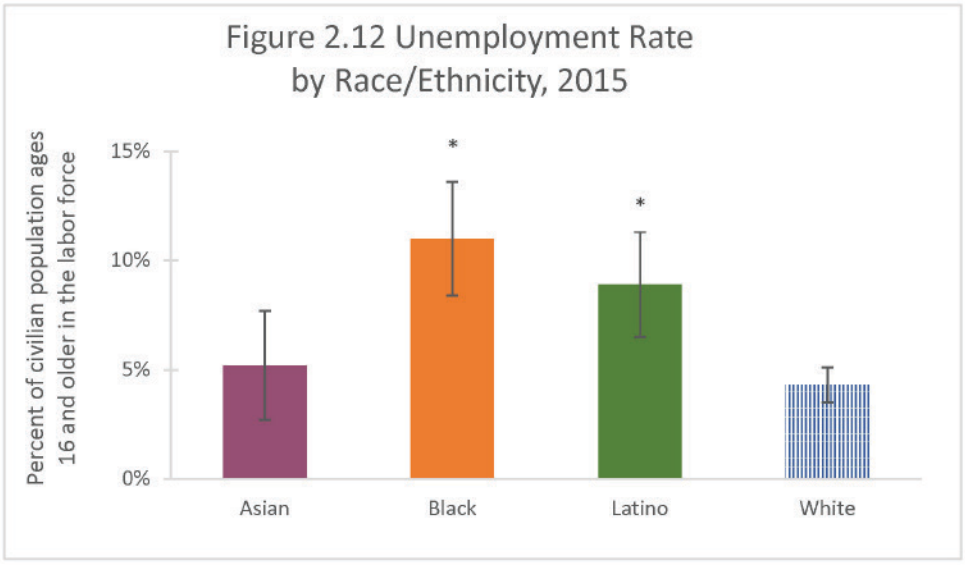
The unemployment rate is defined as the percentage of the labor force that is unemployed. People who are not working and not looking for work are not part of the labor force and, therefore, are not counted in the unemployment rate. To get a full picture of the employment status of a population, one must also look at the labor force participation rate. The labor force participation rate is the proportion of the total population that is either employed or looking for work. People not in the labor force are full-time students, homemakers, and individuals above the age of 64. Included in this group are also "discouraged' individuals -- people who want to work, but have given up looking because they think no work is available, could not find work, lack the right education or training, or worry that a potential employer may discriminate against them because of their age or race/ethnicity. Although not employed, discouraged workers are not counted in the unemployment rate or the labor force because they have stopped actively looking for work. In 2016, of people in the U.S. ages 16 to 54 who were out of the labor force because they were not looking for work, 11.9% wanted to work (33). While the overall labor force participation rates nationally are similar for Black adults (62.5%) and White adults (62.9%), differences have been observed by sex, race, and age. For example, the labor force participation rate for Black youth ages 16 to 19 was 30.8%, while the labor force participation rate for White youth ages 16 to 19 was 37.5% (34).

In 2010, Boston supplied an estimated 657,669 jobs, approximately one out of every five jobs in Massachusetts and one out of every fourteen jobs in New England (35). The number of Boston-based jobs exceeded the resident labor force by more than double. This meant that many who worked in Boston did not live in the city (35). This section presents data on the employment status of Boston residents, and the association between health indicators and employment status.



NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

In 2015, the unemployment rate for Boston residents ages 16 and older dropped to a 5-year low of 7%.



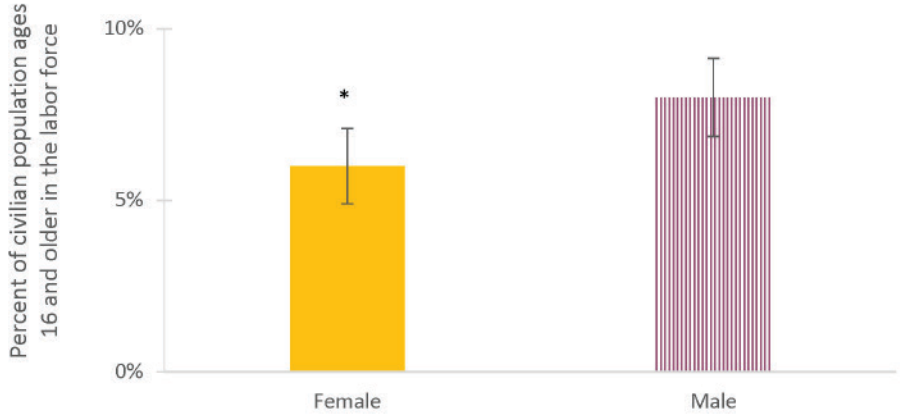
* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator. Due to limited data availability, data for Asian residents includes individuals who identified as Latino (less than 1% of Asian residents identified as Latino).
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

In 2015, the unemployment rate was higher for Black (11%) and Latino (9%) residents compared with White residents (4%).

In 2015, the unemployment rate was lower among Boston female residents (6%) compared with male residents (8%).

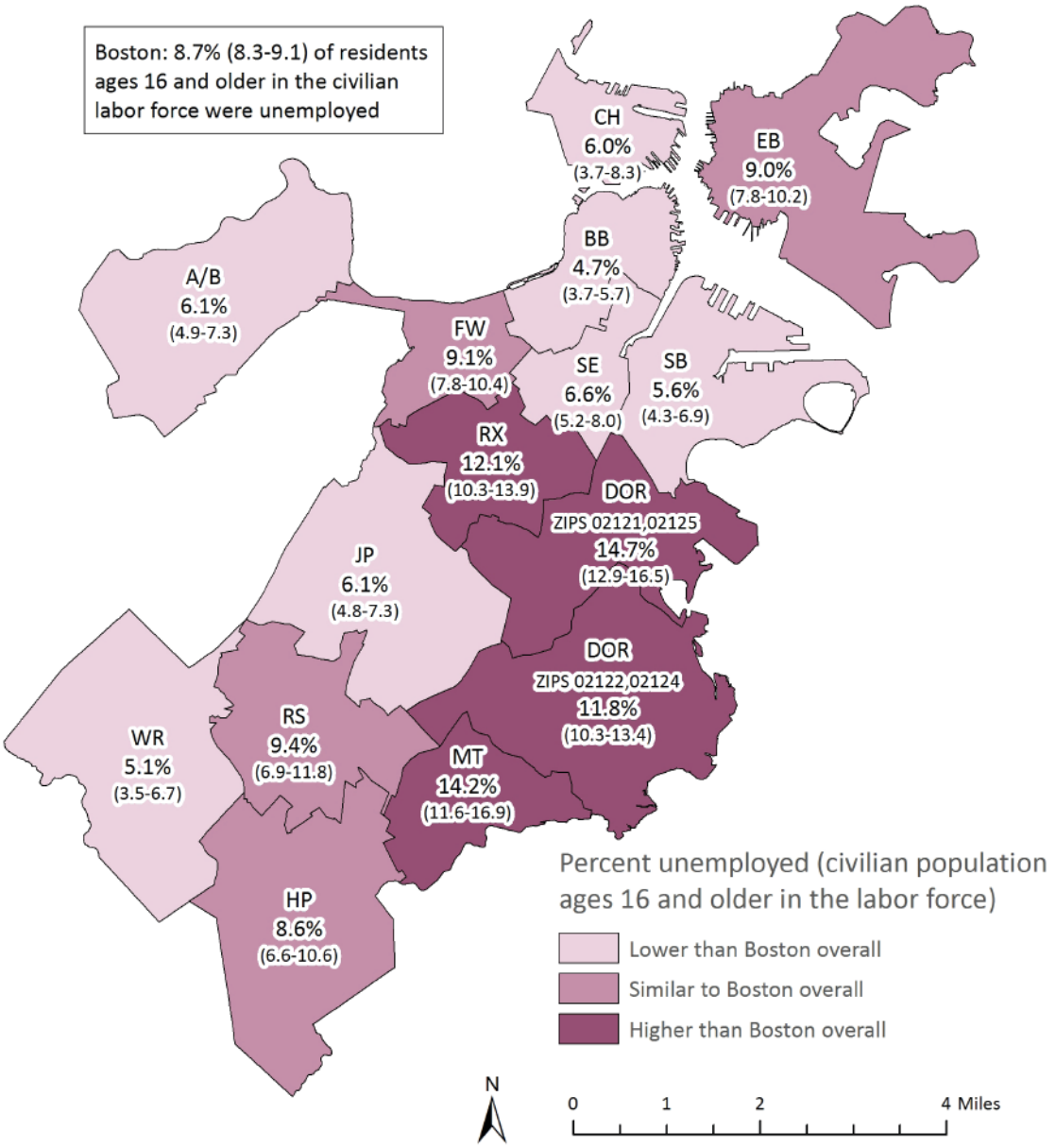
Figure 2.13 Unemployment Rate by Sex, 2015



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

Figure 2.14 Unemployment Rate by Neighborhood, 2011-2015



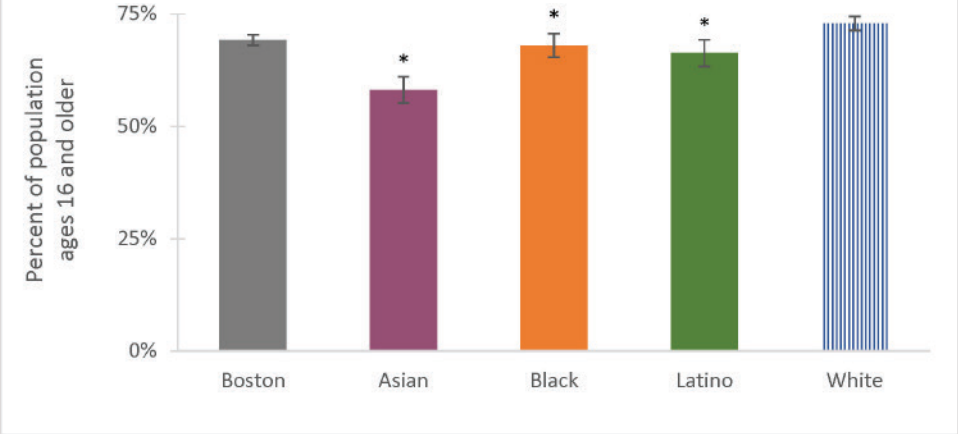
NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End. "SE" includes the South End and Chinatown.

DATA SOURCE: American Community Survey, 2011-2015, U.S. Census Bureau

For 2011-2015, the unemployment rate for Boston residents was higher in Dorchester (zip codes 02121, 02125), Dorchester (zip codes 02122, 02124), Mattapan, and Roxbury compared with Boston overall. The unemployment rate was lower in Allston/Brighton, Back Bay, Charlestown, Jamaica Plain, South Boston, the South End, and West Roxbury compared with Boston overall.

In 2015, the labor force participation rate for Boston residents ages 16 and older was 69%. Labor force participation was lower among Asian (58%), Black (68%), and Latino (66%) residents compared with White residents (73%).

Figure 2.15 Labor Force Participation Rate by Race/Ethnicity, 2015

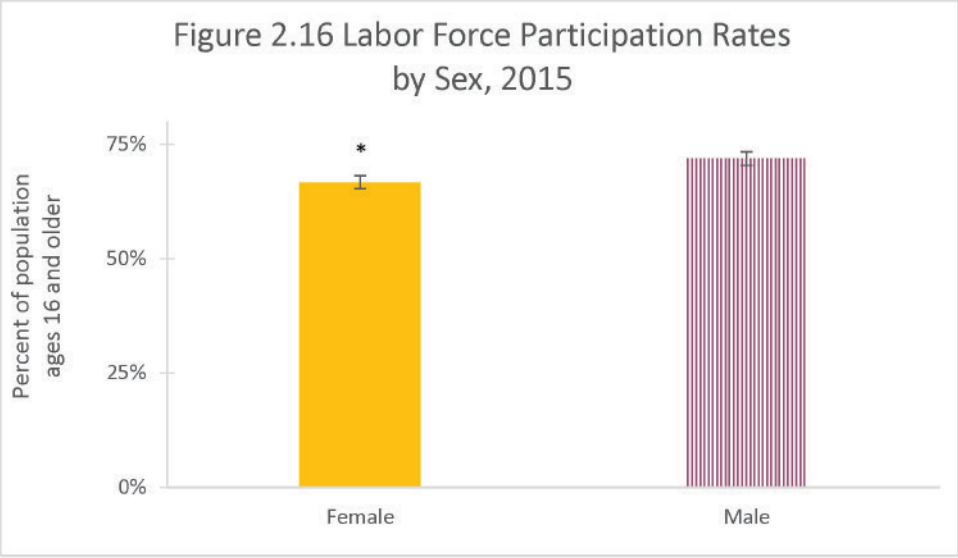


* Statistically significant difference when comparisons are made between racial/ethnic groups

NOTE: Bars with patterns indicate the reference group within each selected indicator. Due to limited data availability, data for Asian residents includes individuals who identified as Latino (less than 1% of Asian residents identified as Latino).
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

In 2015, the labor force participation rate was lower for Boston female residents (67%) compared with male residents (72%).

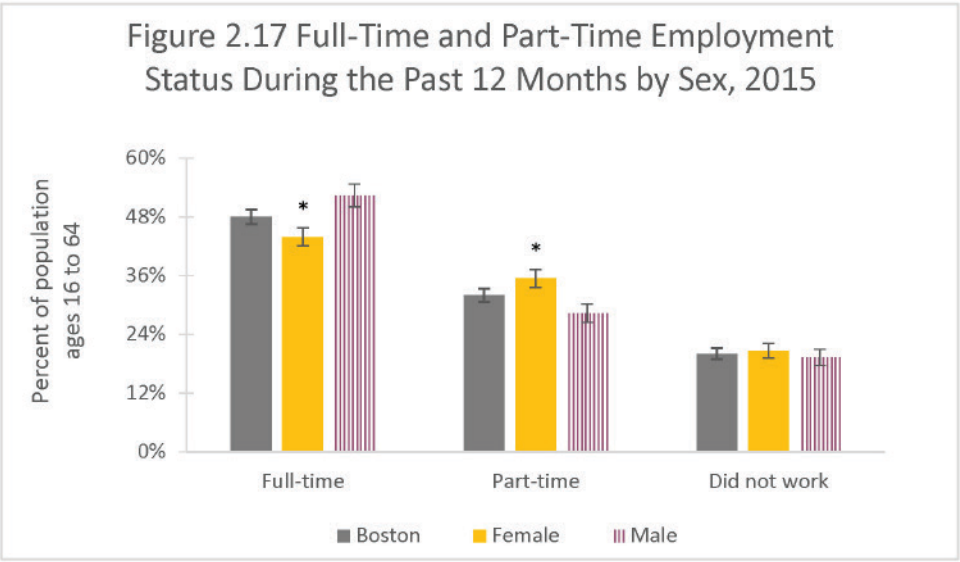
Figure 2.16 Labor Force Participation Rates by Sex, 2015



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

Figure 2.17 Full-Time and Part-Time Employment Status During the Past 12 Months by Sex, 2015

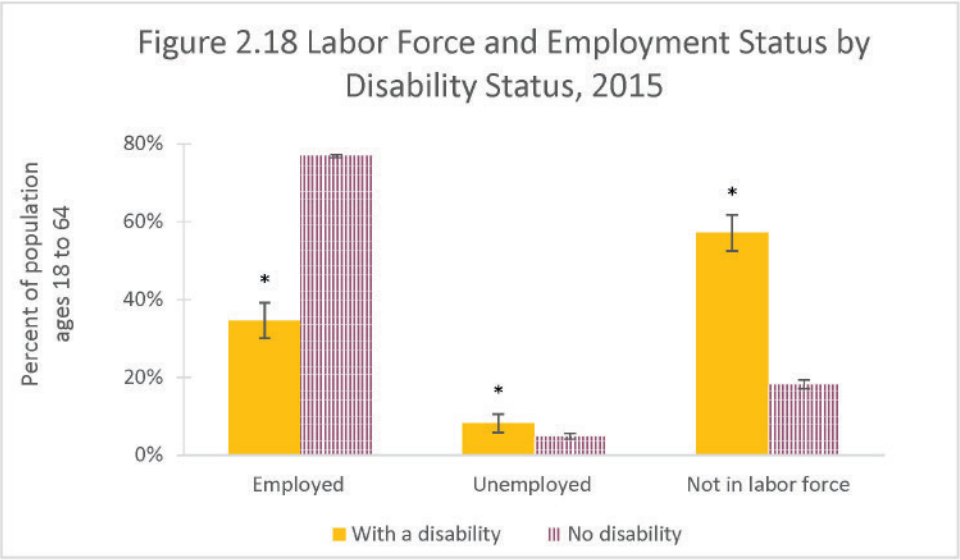


* Statistically significant difference when comparisons are made between females and males

NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

In 2015, a lower percentage of Boston female residents (44%) worked full-time compared with male residents (52%). A higher percentage of female residents (35%) worked part-time compared with male residents (28%).

Figure 2.18 Labor Force and Employment Status by Disability Status, 2015



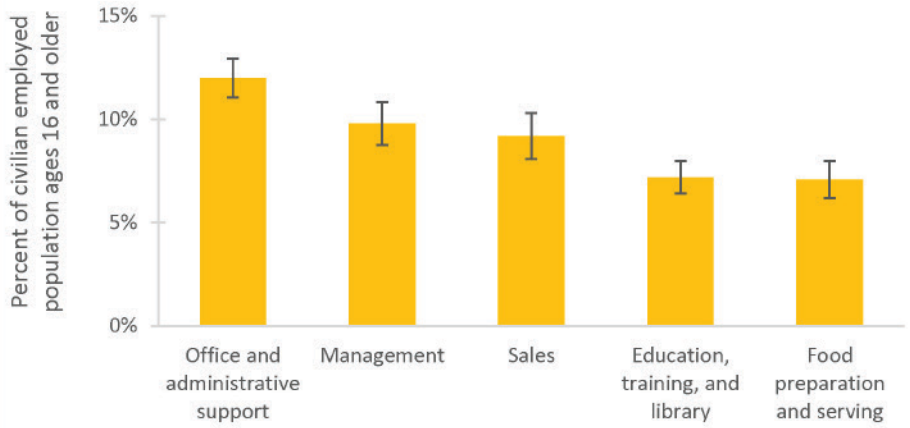
* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

In 2015 in Boston, a higher percentage of residents ages 18-64 with a disability were unemployed (8%) or not in the labor force (57%) compared with residents with no disability, 5% and 18%, respectively. A lower percentage of residents with a disability were employed (35%) compared with residents with no disability (77%).

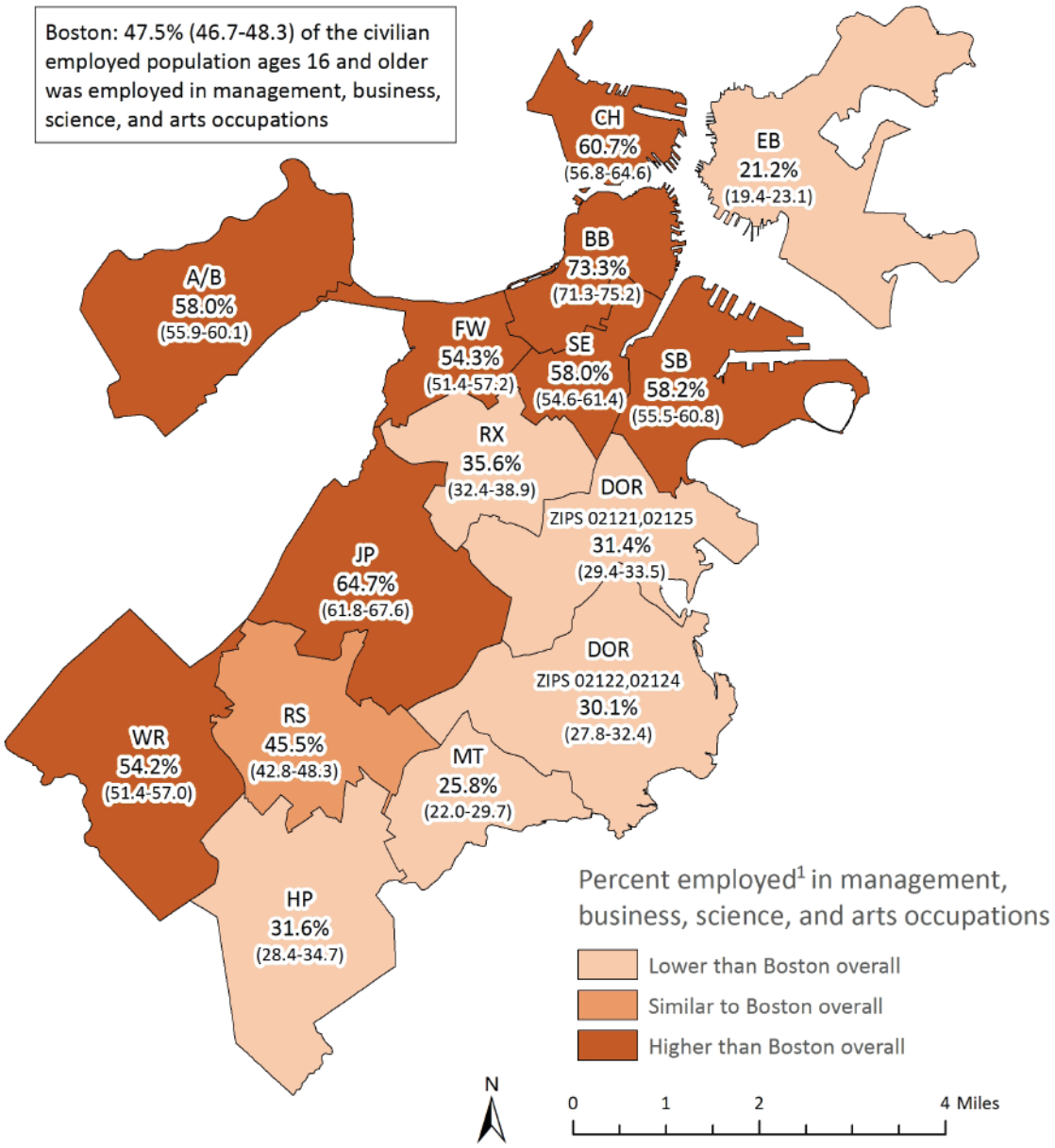
In 2015, the most commonly held occupations among employed residents ages 16 and older in Boston were office and administrative support occupations (12%), management occupations (10%), sales occupations (9%), education, training, and library occupations (7%), and food preparation and serving occupations (7%).

Figure 2.19 Occupations Among Boston Residents, 2015



DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

Figure 2.20 Employment in Management, Business, Science, and Arts Occupations by Neighborhood, 2011-2015



[1] Among the civilian employed population ages 16 and older

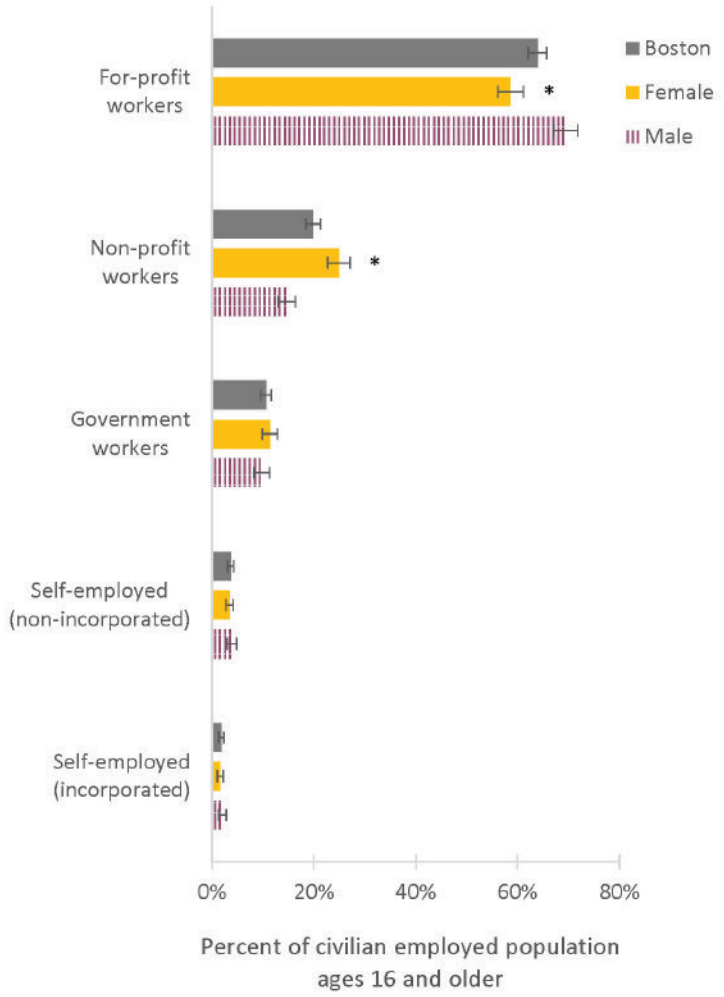
NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End. "SE" includes the South End and Chinatown.

DATA SOURCE: American Community Survey, 2011-2015, U.S. Census Bureau

During 2011-2015 combined, the largest percentage of employed residents 16 and older in Boston worked in management, business, science, and arts occupations (48%). Compared with Boston overall, a higher percentage of residents in Allston/Brighton, Back Bay, Charlestown, Fenway, Jamaica Plain, South Boston, the South End, and West Roxbury worked in management, business, science, and arts occupations while a lower percentage of residents in Dorchester (zip codes 02121, 02125), Dorchester (zip codes 02122, 02124), East Boston, Hyde Park, Mattapan, and Roxbury worked in these occupations.

In 2015, a higher percentage of female residents worked for non-profit companies (25%) compared with male residents (15%), and a lower percentage of females worked for for-profit companies (59%) compared with male residents (70%).

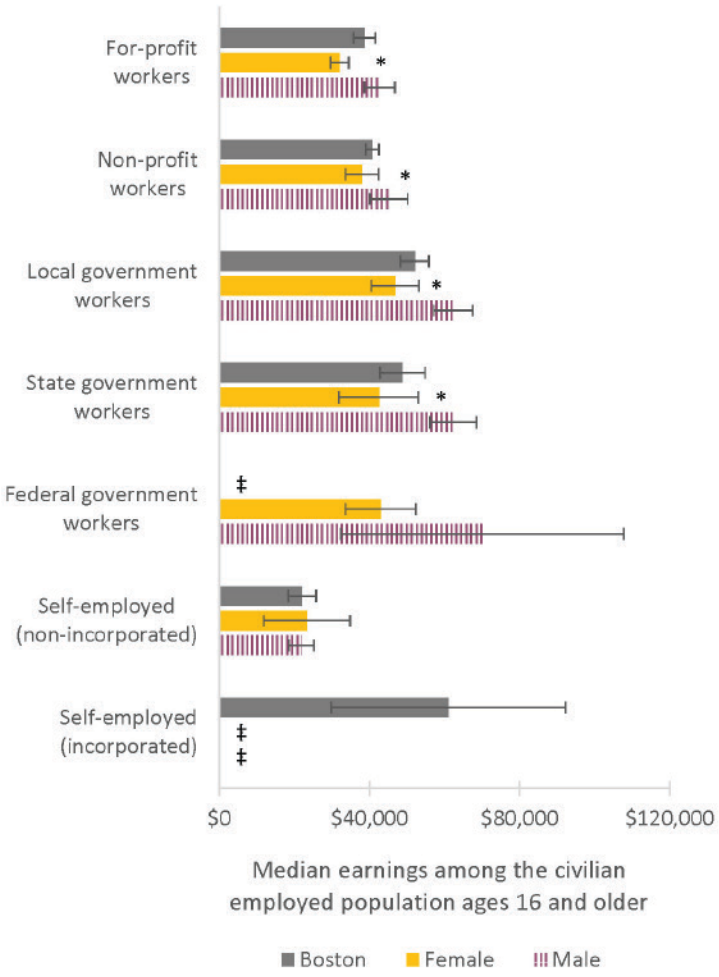
Figure 2.21 Class of Worker by Sex, 2015



* Statistically significant difference when comparisons are made between females and males

NOTE: Bars with patterns indicate the reference group within each selected indicator. Data not presented due to insufficient sample size for unpaid family workers.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

Figure 2.22 Median Earnings by Class and Sex of Worker, 2014



* Statistically significant difference when comparisons are made between females and males
‡ Data not presented due to insufficient sample size

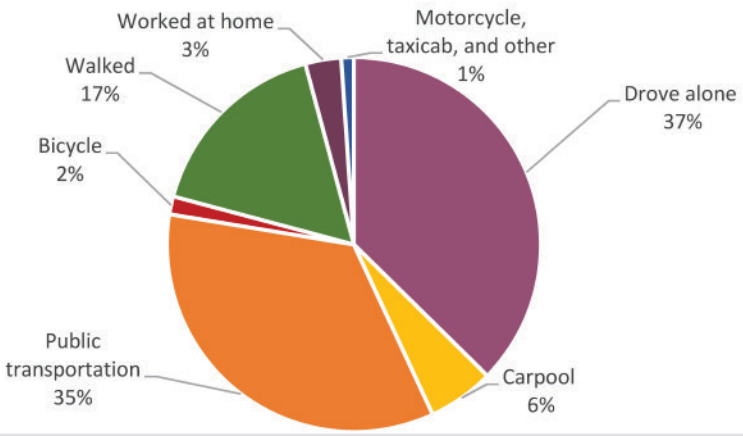
NOTE: Bars with patterns indicate the reference group within each selected indicator. Median earnings were for the past 12 months.
DATA SOURCE: American Community Survey, 2014, U.S. Census Bureau

In 2014, median earnings were lower for Boston female residents compared with male residents in the following sectors:

- For-profit ($32,079 vs. $42,706)
- Non-profit ($37,991 vs. $45,141)
- Local government ($46,890 vs. $62,357)
- State government ($42,491 vs. $62,344)

In 2015, the most popular means of transportation to work in Boston were driving alone in a car, truck, or van (37%), taking public transportation (35%), and walking (17%).

Figure 2.23 Means of Transportation to Work[1], 2015



[1] Among workers 16 years and older

NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

This table describes select health indicators by employment status. A higher percentage of Boston adult residents who were out of work had diabetes, hypertension, persistent anxiety, and persistent sadness compared with those who were employed. These percentages remained higher after adjusting for age, race/ethnicity, and sex (adjusted data not shown).

Similarly, a higher percentage of adult residents whose employment status was "other" had asthma, diabetes, hypertension, and persistent sadness compared with those who were employed. Percentages of asthma, diabetes, and persistent sadness remained higher after adjusting for age, race/ethnicity, and sex (adjusted data not shown). For hypertension, however, the differences were no longer evident after adjusting for age, race/ethnicity, and sex.

Figure 2.24 Health Indicators by Employment Status, 2015

	Employed	Out of work	Other[1]
Asthma	10.2% (8.3-12.5)	9.4% (5.4-15.8)	15.0%* (12.1-18.4)
Diabetes	4.5% (3.5-5.7)	10.5%* (6.4-16.7)	15.0%* (12.7-17.8)
Hypertension	17.8% (15.7-20.2)	28.2%* (20.0-38.4)	37.3% * (33.5-41.3)
Obesity	21.3% (18.7-24.1)	22.8% (15.6-32.1)	22.7% (19.4-26.3)
Persistent anxiety	20.5% (17.7-23.6)	36.9%* (27.1-47.9)	21.3% (17.9-25.2)
Persistent sadness	7.3% (5.8-9.2)	30.1%* (21.0-41.0)	16.7%* (13.6-20.2)

* Statistically significant difference when compared to reference group (employed)
[1]Includes homemakers, students, retirees, and those unable to work

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

Employment Summary

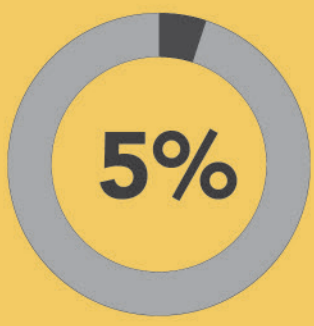
The unemployment rate for Boston residents ages 16 and older dropped to a 5-year low, from 12% in 2011 to 7% in 2015; however, the unemployment rate for Boston residents was higher for Black and Latino residents compared with White residents. We also found inequities in the unemployment rate at the neighborhood level. The unemployment rate for Boston residents was higher in Dorchester (zip codes 02121, 02125), Dorchester (zip codes 02121, 02125), Mattapan, and Roxbury compared with Boston overall. The unemployment rate was lower among Boston female residents compared with male residents. Additionally, a higher percentage of residents ages 18 to 64 with a disability in Boston were unemployed compared with residents who had no disability.

A higher percentage of female residents worked for non-profit companies compared with male residents, and a lower percentage of females worked for for-profit companies compared with male residents. A lower percentage of females worked full-time compared with males. The median income was lower for females compared with males in the for-profit and non-profit sectors, as well as in local and state government. The three most popular means of transportation to work in Boston were driving alone, taking public transportation, and walking.

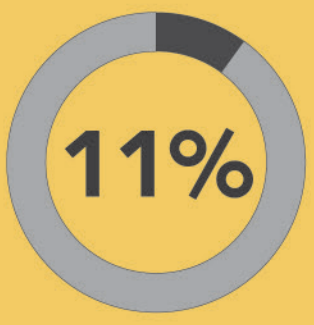
Employment status impacts an individual's overall health. After adjusting for age, race/ethnicity, and sex, we observed that a higher percentage of Boston residents who were out of work had diabetes, persistent anxiety, and persistent sadness compared with those who were employed. A higher percentage of residents whose employment status was "other" (homemakers, students, retirees, and those unable to work) had asthma, diabetes, hypertension, and persistent sadness compared with those who were employed.

Employment status and chronic conditions in 2015:

Diabetes:



among employed residents



among unemployed residents

Persistent sadness:

7% among employed residents

30% among unemployed residents

Persistent Anxiety:

37% among unemployed residents

21% among employed residents

Health of Boston 2016-2017

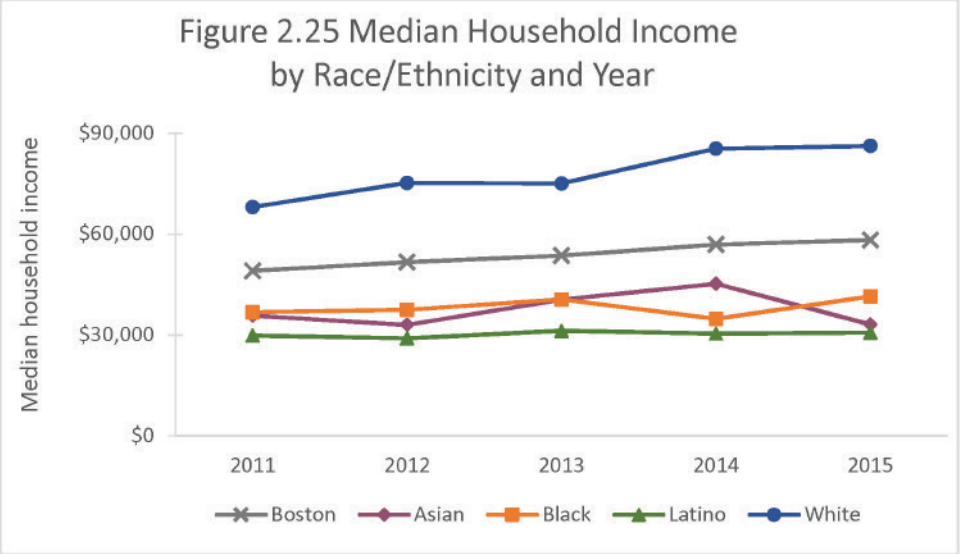
Income & Poverty

By some measures, Boston is the most unequal city in the U.S. (36). In 2015, the poverty rate was 14% in the U.S., 11% in Massachusetts, and 21% in Boston, with significant geographic and racial/ethnic variation (see poverty charts and maps in this section) (37). Residents living at or below poverty have a difficult time making ends meet. The gap between the current minimum wage ($11) and what is considered necessary to support a family (at least $17) makes it difficult for Boston's lowest-earning families to enjoy the same resources and financial safety net as higher-income families (38). It should be noted that the *Health and Income: The Impact of Changes to Boston's Living Wage Ordinance on the Health of Living Wage Workers* report produced by the Boston Public Health Commission in 2016 found that the wage of $17 per hour for 40 hours per week only covers the most basic needs for a family of four (with two adults working full-time and two children) living in the City of Boston, and does not include enough for savings, emergency expenditures, or larger one-time expenses such as car repairs or medical bills (38).

In Boston, individuals making under $50,000 a year experience worse health outcomes than residents with higher incomes (38). The cumulative effects of poverty are powerful predictors of poor health outcomes, often explained by a combination of environmental factors, social pressures, and influences on personal behavior. Poverty leads to chronic stress, which has been associated with poor health outcomes, and may encourage adverse coping behaviors such as tobacco use and excessive alcohol consumption. Chronic diseases such as diabetes have been shown to be associated with income (39, 40). Individuals making less than $25,000 are two and a half times more likely to develop diabetes than those with incomes over $50,000 (38). Those living below the poverty line, especially children, are more likely to develop asthma symptoms (41). Inequities in HIV/AIDS death rates between socioeconomic groups is partly attributed to higher rates of risk behavior, depression, and impaired access to antiretroviral therapy (42, 43).

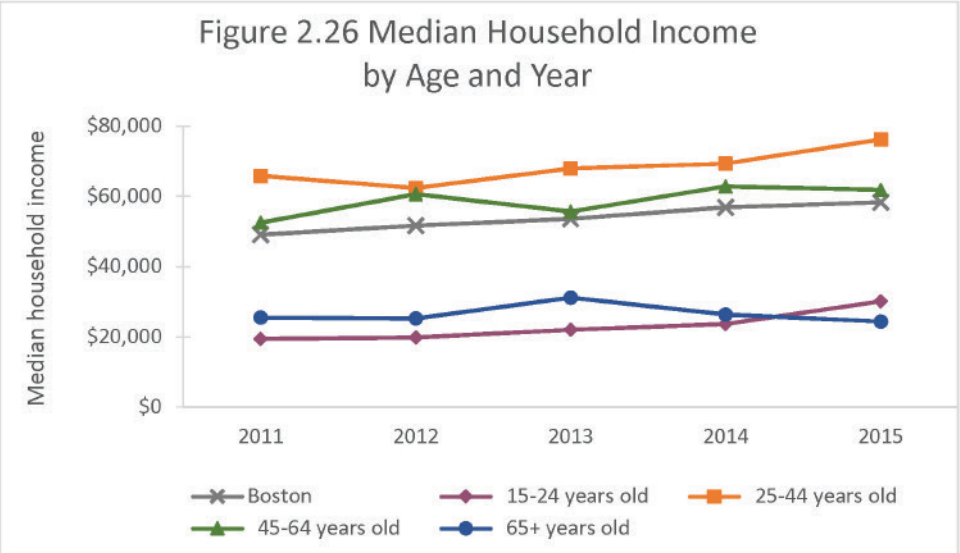
This section presents data on household income, poverty, and food insecurity in Boston, and the association between income and selected health indicators.

In 2015, the median household income for Boston residents was $58,263. Asian ($33,185), Black ($41,465), and Latino ($30,687) households had lower median household incomes compared with White households ($86,194) in 2015.



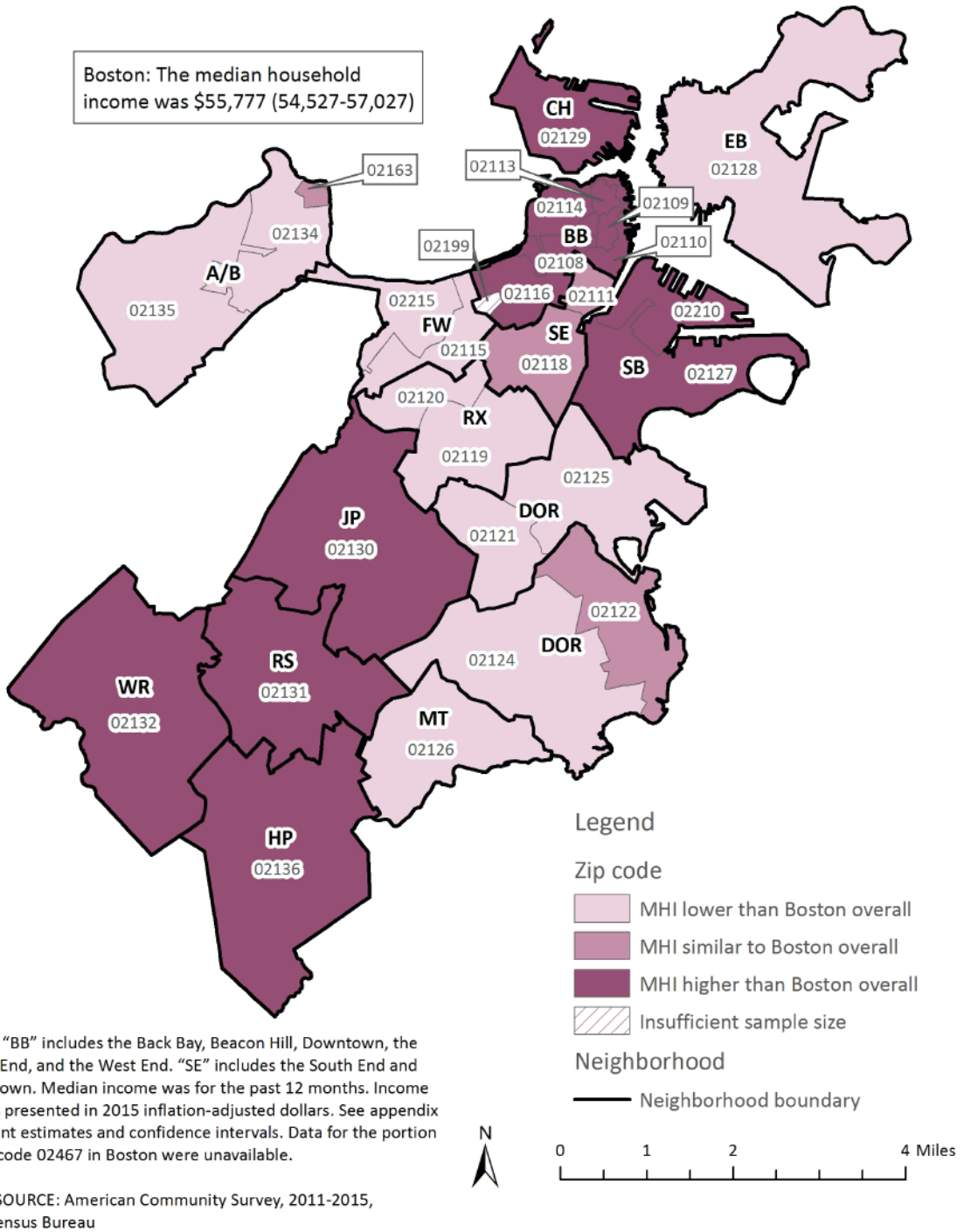
NOTE: See appendix for confidence intervals for point estimates. Due to limited data availability, data for Asian residents includes individuals who identified as Latino (less than 1% of Asian residents identified as Latino). Median income was for the past 12 months. Income data for each year is inflation-adjusted to that year's dollars.
DATA SOURCE: American Community Survey, 2011, 2012, 2013, 2014, 2015, U.S. Census Bureau

In 2015, compared with the median income of households in which the head of household was 25-44 years of age ($76,162), households with the head of household ages 15-24, 45-64, and 65 years and older had a lower median household income, $30,049, $61,841, and $24,311, respectively.



NOTE: See appendix for confidence intervals for point estimates. Median income was for the past 12 months. Income data for each year is inflation-adjusted to that year's dollars.
DATA SOURCE: American Community Survey, 2011, 2012, 2013, 2014, 2015, U.S. Census Bureau

Figure 2.27 Median Household Income (MHI) by Zip Code, 2011-2015

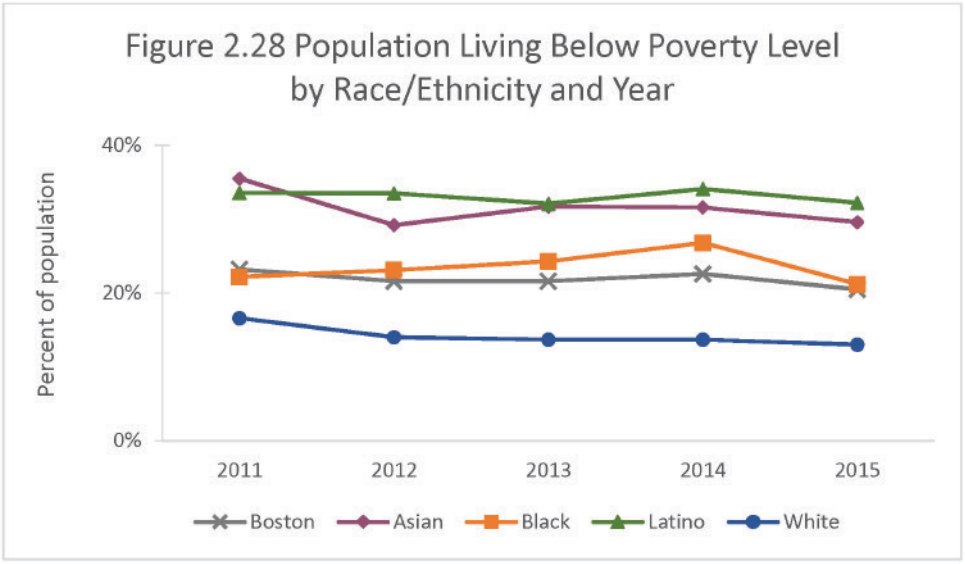


NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End. "SE" includes the South End and Chinatown. Median income was for the past 12 months. Income data is presented in 2015 inflation-adjusted dollars. See appendix for point estimates and confidence intervals. Data for the portion of zip code 02467 in Boston were unavailable.

DATA SOURCE: American Community Survey, 2011-2015, U.S. Census Bureau

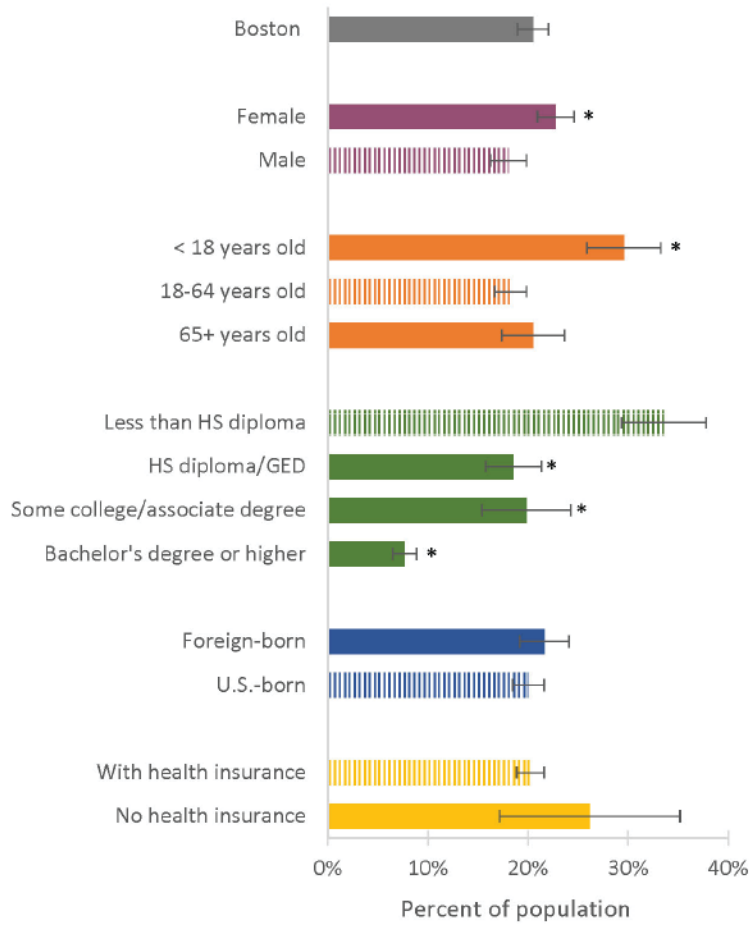
During 2011-2015, the median household income for Boston residents was $55,777. Residents living in zip codes 02115, 02119, 02120, 02121, 02124, 02125, 02126, 02128, 02134, 02135, and 02215 had lower median household incomes compared with Boston overall. Residents living in zip codes 02108, 02109, 02110, 02113, 02114, 02116, 02127, 02129, 02130, 02131, 02132, 02136, and 02210 had higher median household incomes compared with Boston overall.

In 2015, an estimated 21% of Boston residents were living below the poverty level. The percentages of Asian (30%), Black (21%), and Latino (32%) residents living below the poverty level were higher compared with White residents (13%).



NOTE: See appendix for confidence intervals for point estimates. Due to limited data availability, data for Asian residents includes individuals who identified as Latino (less than 1% of Asian residents identified as Latino). Poverty status was determined for the past 12 months for all people except institutionalized people, people in military group quarters, people in college dormitories, and unrelated individuals under 15 years old.
DATA SOURCE: American Community Survey, 2011, 2012, 2013, 2014, 2015, U.S. Census Bureau

Figure 2.29 Population Living Below Poverty Level by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator. Education is among adults ages 25 and older. Poverty status was determined for the past 12 months for all people except institutionalized people, people in military group quarters, people in college dormitories, and unrelated individuals under 15 years old.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

In 2015, an estimated 21% of Boston residents lived below the poverty level.

A higher percentage of the following groups lived below the poverty level:

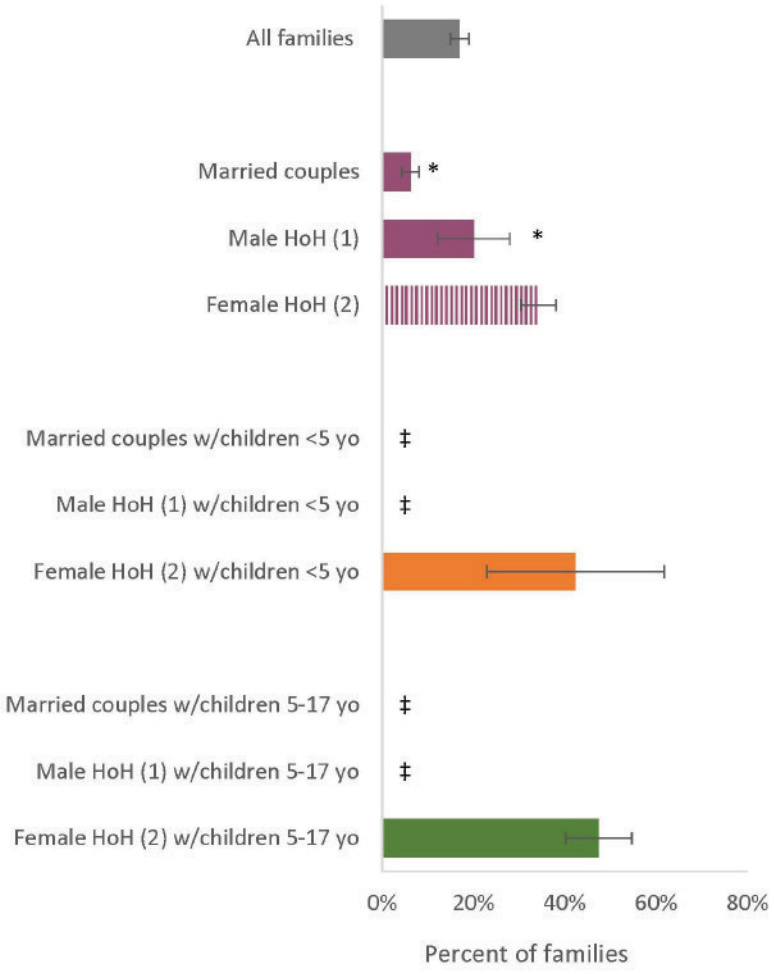
- Females (23%) compared with males (18%)
- Children under the age of 18 (30%) compared with adults ages 18-64 (18%)

A lower percentage of the following groups lived below the poverty level:

- Residents with a high school diploma or GED (19%), some college education or an associate degree (20%), or a bachelor's degree or higher (8%) compared with those with less than a high school education (34%)

In 2015, 17% of all Boston families lived below the poverty level. Compared with families with female heads of household and no husband present (34%), a lower percentage of families with married couples (6%) and male heads of household and no wife present (20%) lived below the poverty level.

Figure 2.30 Families Living Below Poverty Level by Family Type, 2015

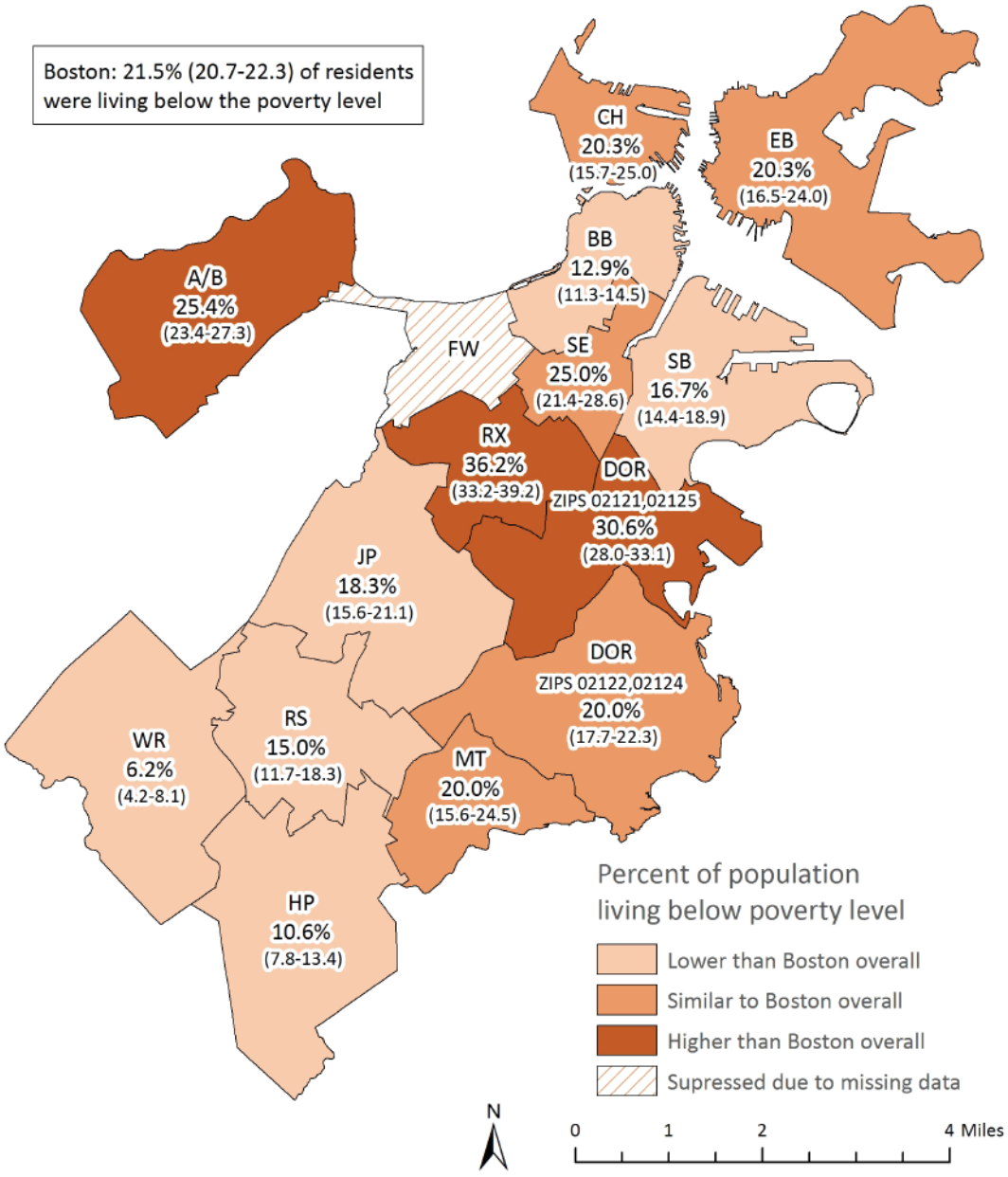


*Statistically significant difference when compared to reference group
‡ Data not presented due to insufficient sample size
(1) Male head of household, no wife present
(2) Female head of household, no husband present

NOTE: Poverty status was determined for the past 12 months for all people except institutionalized people, people in military group quarters, people in college dormitories, and unrelated individuals under 15 years old.

DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

Figure 2.31 Percent of Population Living Below Poverty Level by Neighborhood, 2011-2015



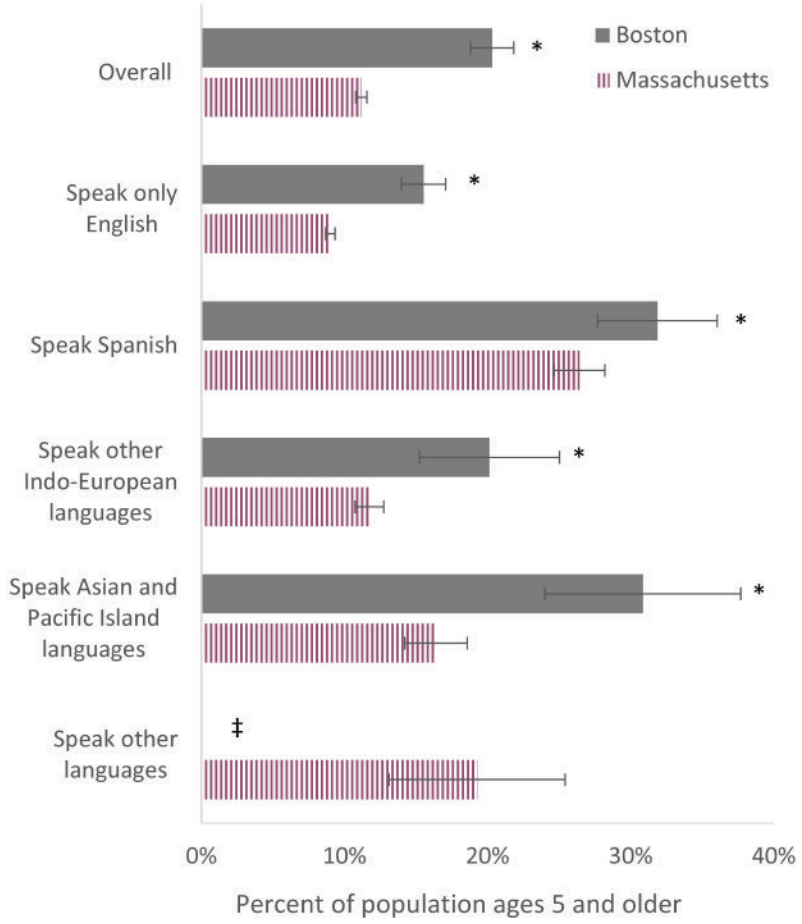
NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End. "SE" includes the South End and Chinatown. Poverty status was determined for the past 12 months for all people except institutionalized people, people in military group quarters, people in college dormitories, and unrelated individuals under 15 years old. Poverty status could not be determined for more than 20% of the population of Fenway, and therefore, a reliable estimate could not be calculated.

DATA SOURCE: American Community Survey, 2011-2015, U.S. Census Bureau

During 2011-2015 combined, Allston/Brighton, Dorchester (zip codes 02121, 02125), and Roxbury had a higher percentage of residents living below the poverty level compared with Boston overall. In the same time period, Back Bay, Hyde Park, Jamaica Plain, Roslindale, South Boston, and West Roxbury had a lower percentage of residents living below the poverty level compared with Boston overall.

In 2015, a higher percentage of Boston residents who spoke English, Spanish, other Indo-European languages, or Asian and Pacific Island languages at home lived below the poverty level compared with their counterparts in Massachusetts.

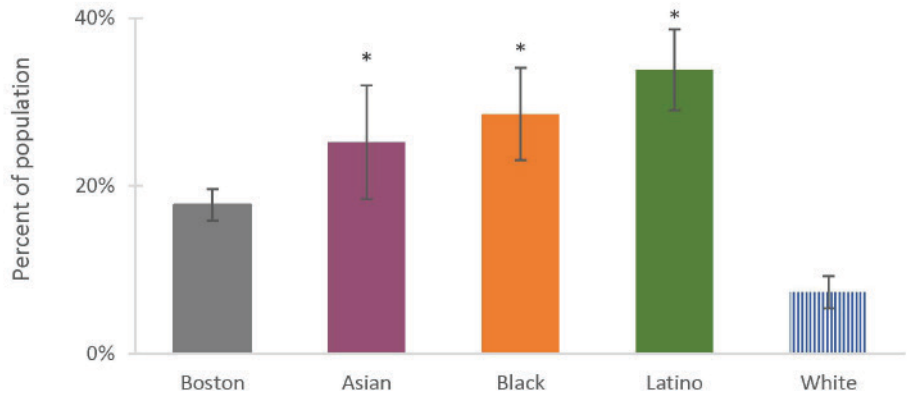
Figure 2.32 Population Living Below Poverty Level by Language Spoken at Home, Boston and Massachusetts, 2015



* Statistically significant difference when compared to reference group
‡ Data not presented due to insufficient sample size

NOTE: Bars with patterns indicate the reference group within each selected indicator. Poverty status was determined for the past 12 months for all people except institutionalized people, people in military group quarters, people in college dormitories, and unrelated individuals under 15 years old.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

Figure 2.33 Supplemental Nutrition Assistance Program (SNAP) Benefits in the Past 12 Months by Race/Ethnicity, 2015

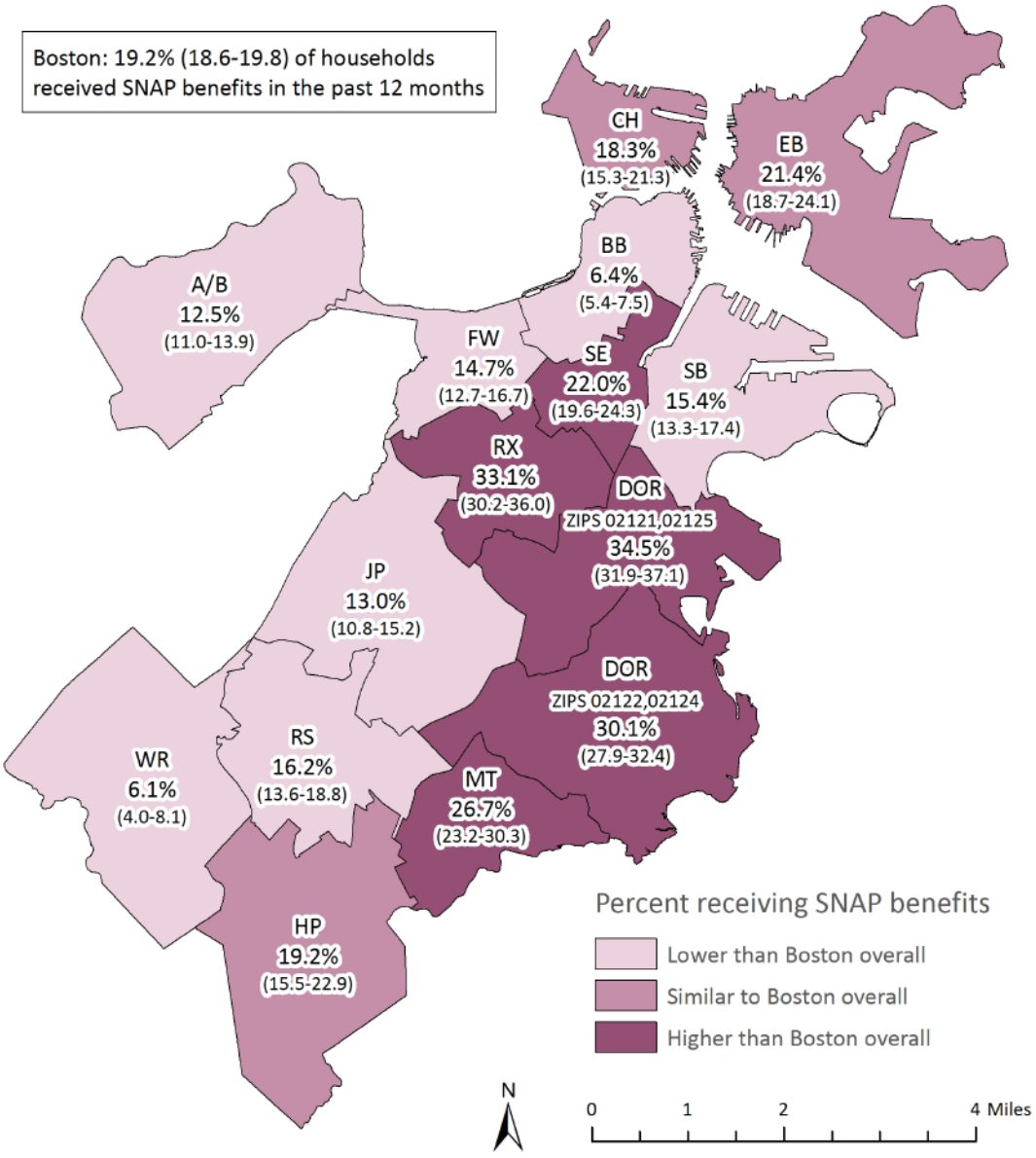


* Statistically significant difference when comparisons are made between racial/ethnic groups

NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 18% of Boston residents received benefits from the Supplemental Nutrition Assistance Program (SNAP) in the past 12 months. The percentage of residents receiving SNAP benefits was higher for Asian (25%), Black (29%), and Latino (34%) residents compared with White residents (7%).

Figure 2.34 Supplemental Nutrition Assistance Program (SNAP) Benefits by Neighborhood, 2011-2015



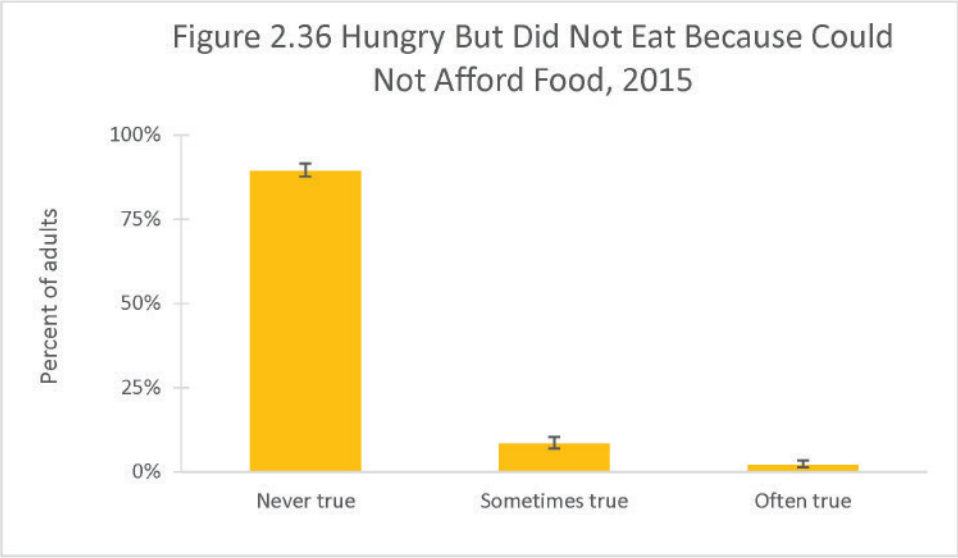
NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.
"SE" includes the South End and Chinatown.

DATA SOURCE: American Community Survey, 2011-2015, U.S. Census Bureau

During 2011-2015 combined, 19% of Boston households received benefits from the Supplemental Nutrition Assistance Program (SNAP) in the past 12 months. A higher percentage of households in Dorchester (zip codes 02121, 02125), Dorchester (zip codes 02122, 02124), Mattapan, Roxbury, and the South End received SNAP benefits compared with Boston overall. A lower percentage of households in Allston/Brighton, Back Bay, Fenway, Jamaica Plain, Roslindale, South Boston, and West Roxbury received SNAP benefits compared with Boston overall.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

For 6% of Boston adult residents in 2015, it was often true that the food they purchased did not last and they did not have money to get more. This was sometimes true for 14% of adults.



DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

In 2015, it was often true that 2% of Boston adult residents remained hungry because they could not afford food. This was sometimes true for 9% of adults.

This table describes select health indicators by household income. A higher percentage of Boston adult residents with a household income less than $25,000 had asthma, diabetes, hypertension, obesity, persistent anxiety, and persistent sadness compared with those with a household income of $50,000 or more. Percentages of diabetes, hypertension, obesity, persistent anxiety, and persistent sadness remained higher after adjusting for age, race/ethnicity, and sex (adjusted data not shown). For asthma, however, the differences were no longer evident after adjusting for age, race/ethnicity, and sex.

A higher percentage of adult residents with a household income of $25,000-$49,999 had diabetes, hypertension, obesity, and persistent sadness compared with those with a household income of $50,000 or more. Percentages of diabetes, hypertension, and persistent sadness remained higher after adjusting for age, race/ethnicity, and sex (adjusted data not shown). For hypertension, however, the differences were no longer evident after adjusting for age, race/ethnicity, and sex.

Figure 2.37 Health Indicators by Household Income, 2015

	Less than $25,000	$25,000-$49,999	$50,000 or more
Asthma	16.9%* (13.3-21.2)	11.2% (7.9-15.7)	9.6% (7.5-12.2)
Diabetes	15.3%* (12.4-18.6)	9.1%* (6.5-12.6)	3.9% (3.1-4.9)
Hypertension	33.6%* (29.3-38.1)	28.2%* (23.4-33.7)	18.2% (15.9-20.7)
Obesity	30.4%* (25.8-35.3)	23.3%* (18.5-28.2)	17.2% (14.6-20.1)
Persistent anxiety	26.7%* (22.3-31.5)	21.4% (16.5-27.2)	17.8% (14.8-21.3)
Persistent sadness	20.0%* (16.4-24.2)	12.4%* (8.8-17.3)	4.7% (3.4-6.5)

* Statistically significant difference when compared to reference group ($50,000 or more)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

Income and Poverty Summary

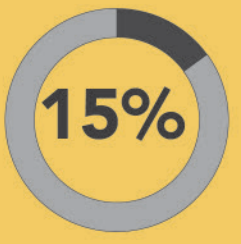
In 2015, there was a high level of income inequality in the city of Boston, and the city's poverty level was double that of Massachusetts. The median household income for Boston was about $58,000 and one in five Boston residents had an income below poverty level. We observed inequities across race for both median household income and poverty level. Asian, Black, and Latino households had lower median incomes compared with White households in the city. Additionally, compared with White residents, the percentage of Asian, Black, and Latino residents living below poverty level was higher. There were also inequities in median household income and poverty level by neighborhood. We observed differences in poverty level by sex, age, and education level. Compared with male residents, the percentage of female residents living below poverty level was higher. It was also higher for residents under the age of 18 compared with those between the ages of 18-64. Residents with a high school diploma or GED, some college education or an associate degree, or a bachelor's degree or higher, had a lower poverty level compared with those with less than a high school education.

In 2015, one in five Boston residents received benefits from the Supplemental Nutrition Assistance Program (SNAP) in the past 12 months. About one in four Asian residents received SNAP benefits in the last 12 months, as did about one-third of both Black and Latino residents. There were also inequities in SNAP benefits by neighborhood. Additionally, for one in five Boston adult residents in 2015, it was sometimes true or often true that the food they purchased did not last and they did not have money to get more.

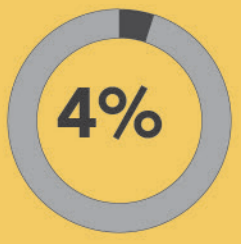
After adjusting for age, race/ethnicity, and sex, we found that a higher percentage of Boston residents with a household income less than $25,000 had diabetes, hypertension, obesity, persistent anxiety, and persistent sadness compared with residents with a household income of $50,000 or greater. A higher percentage of residents with a household income of $25,000-49,999 had diabetes, hypertension, and persistent sadness compared with those with a household income of $50,000 or more. Increasing the median household income for residents would yield more positive health outcomes for these individuals and communities.

Income and chronic conditions in 2015:

Diabetes:



among residents with a household income **less than $25,000**



among residents with a household income of **$50,000 or more**

Obesity:

30% among residents with a household income **less than $25,000**

17% among residents with a household income of **$50,000 or more**

Hypertension:

34% among residents with a household income **less than $25,000**

18% among residents with a household income of **$50,000 or more**

Persistent sadness:

20% among residents with a household income **less than $25,000**

5% among residents with a household income of **$50,000 or more**

Persistent Anxiety:

27% among residents with a household income **less than $25,000**

18% among residents with a household income of **$50,000 or more**

Health of Boston 2016-2017

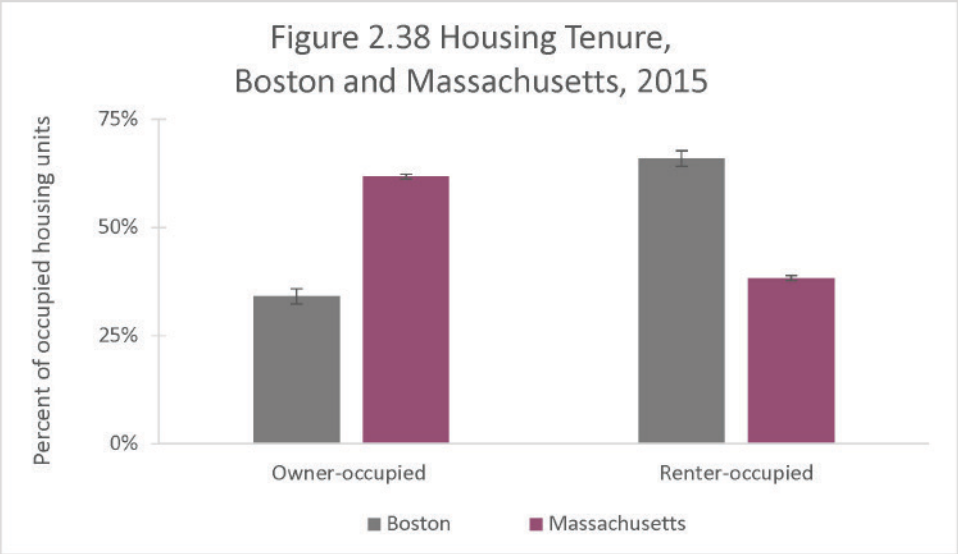
Housing

In Boston, the median value of an owner-occupied housing unit is about $453,000, with over 40% of homes topping over $500,000 (44). Average rental prices in Boston are among the highest in the U.S., just behind New York, San Francisco, and Silicon Valley (38), with almost 40% of residents paying more than $1,500 a month (45). Subsidized housing is available on a limited basis to those with incomes ranging from less than 30-80% of the city-wide median income level depending on the program (46). Programs have a wait ranging from 10 weeks to more than 5 years depending on the application and housing availability (47). Meanwhile, over half of Boston renters pay more than 30% of their income toward rent (48), meaning finances can't go to other necessities such as childcare and food (49). The benefits of home ownership, including tax deductions, cost savings over time compared to renting, and the ability to build equity, are reserved for higher-income individuals. Lower-income individuals who cannot afford home ownership often struggle with the negative impact that residential instability has on crime, mental health, and social capital (50-52).

Safe and stable housing provides personal security, reduces stress and exposure to disease, and provides a foundation for meeting basic hygienic, nutritional, and healthcare needs. Average income gains over the past decade have failed to keep pace with rising housing costs, pushing thousands of residents into unstable housing situations (53). In 2017, 6,135 individuals in Boston were homeless (Figure 2.49). Without consistent access to health care, homeless individuals are less likely to participate in preventative care and are much more likely to utilize the emergency department for non-emergencies. Such patterns of use are not only a burden on the healthcare system, but detrimental to personal health as well (54).

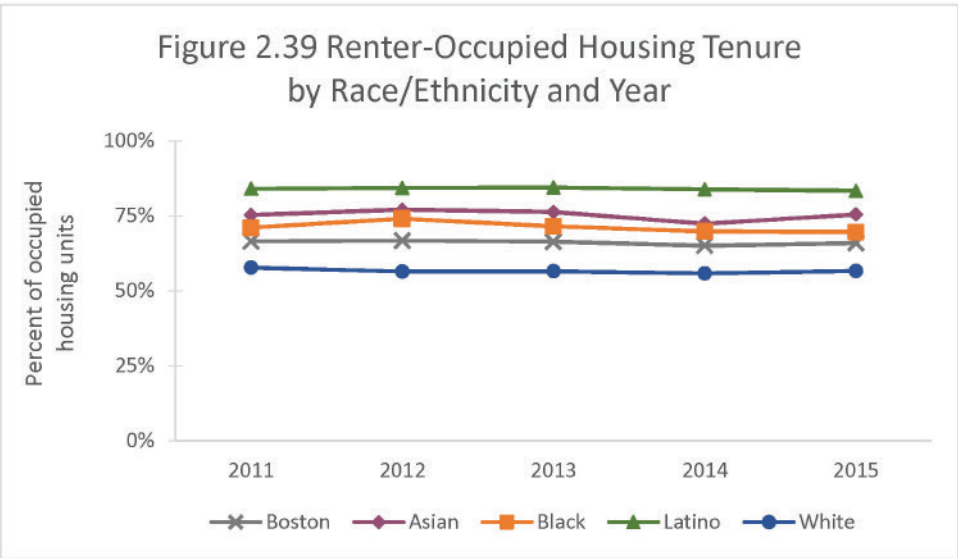
This section presents data on housing tenure, foreclosures, and homelessness, and the association between housing tenure and selected health indicators.

In 2015, 66% of housing units in Boston were occupied by renters compared with 38% in Massachusetts overall. In Boston, 34% of housing units were owner-occupied compared with 62% in Massachusetts overall.



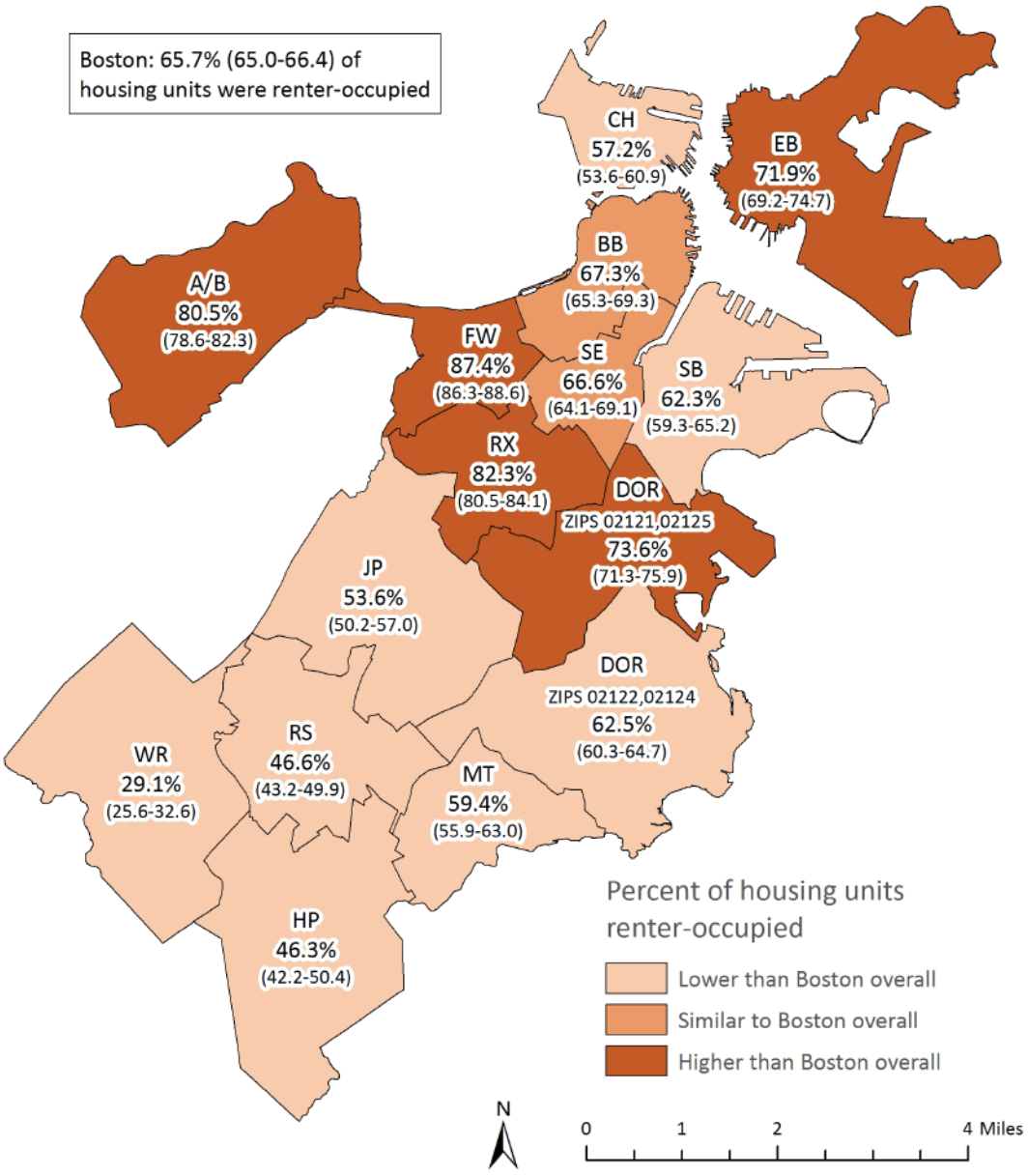
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

In 2015, 66% of Boston residents lived in renter-occupied housing units. Compared with White residents (57%), a higher percentage of Asian (76%), Black (70%), and Latino (83%) residents lived in renter-occupied units.



NOTE: See appendix for confidence intervals for point estimates. Due to limited data availability, data for Asian residents includes individuals who identified as Latino (less than 1% of Asian residents identified as Latino).
DATA SOURCE: American Community Survey, 2011, 2012, 2013, 2014, 2015, U.S. Census Bureau

Figure 2.40 Renter-Occupied Housing Tenure by Neighborhood, 2011-2015

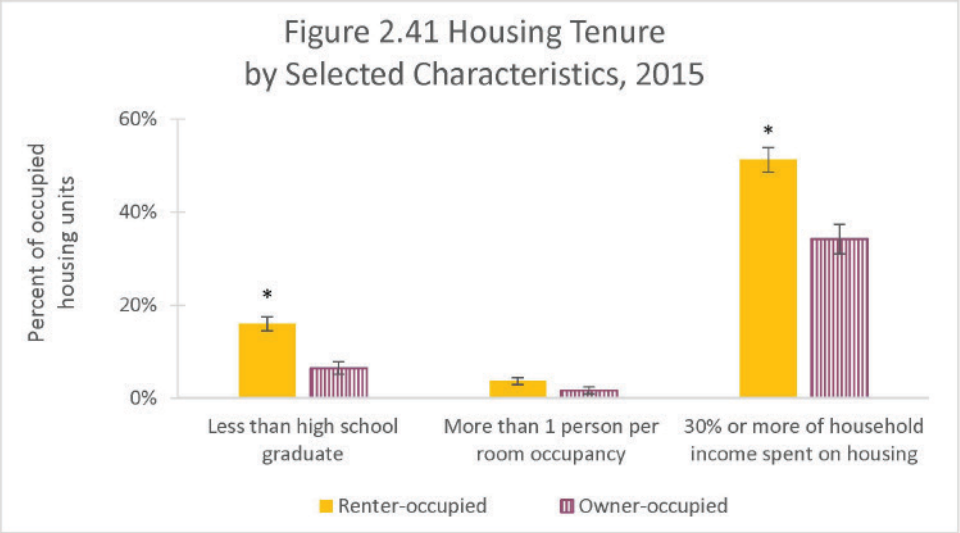


NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End. "SE" includes the South End and Chinatown.

DATA SOURCE: American Community Survey, 2011-2015, U.S. Census Bureau

During 2011-2015, a higher percentage of housing units in Allston/Brighton, Dorchester (zip codes 02121, 02125), East Boston, Fenway, and Roxbury were renter-occupied compared with Boston overall. A lower percentage of housing units were renter-occupied in Charlestown, Dorchester (zip codes 02122, 02124), Hyde Park, Jamaica Plain, Mattapan, Roslindale, South Boston, and West Roxbury compared with Boston overall.

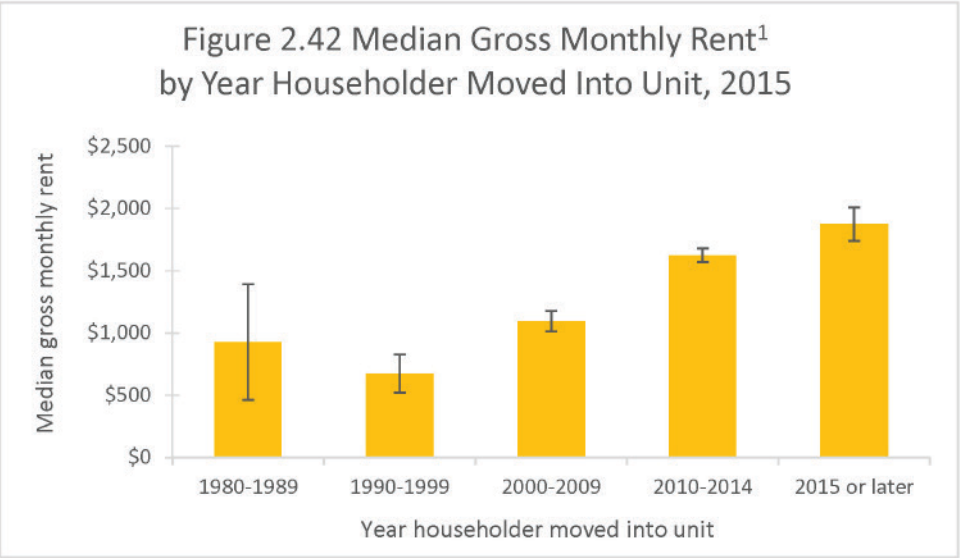
In 2015, a higher percentage of renters in Boston had less than a high school diploma (16%) compared with those who owned their units (6%). In addition, a higher percentage of renters (51%) paid 30% or more of their income on housing compared with those who owned their units (34%).



* Statistically significant difference when compared to reference group

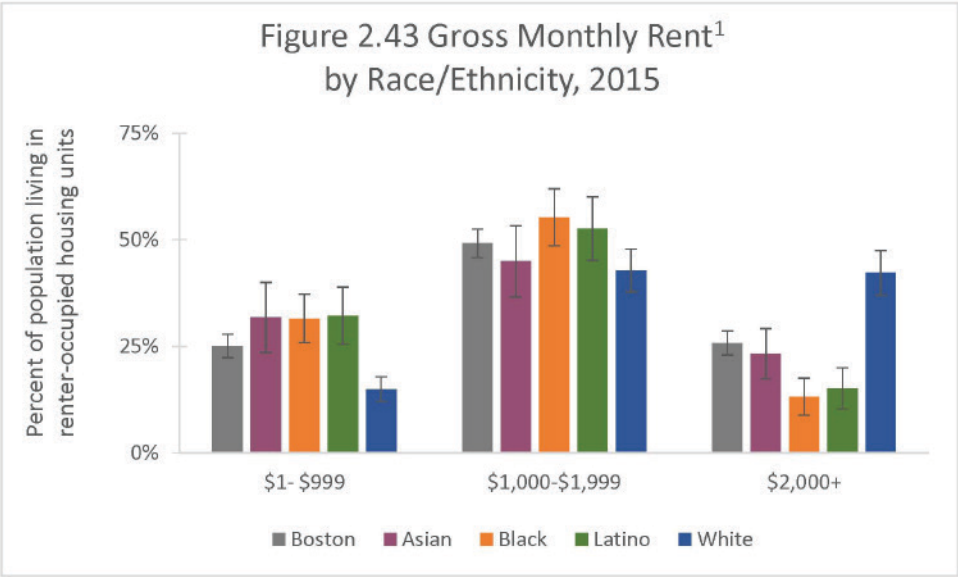
NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

In 2015, the median gross rent for a householder moving into a unit in 2015 or later was $1,876 compared with $928 for householders who moved into a unit during 1980-1989.



[1] Includes average monthly utility costs

DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

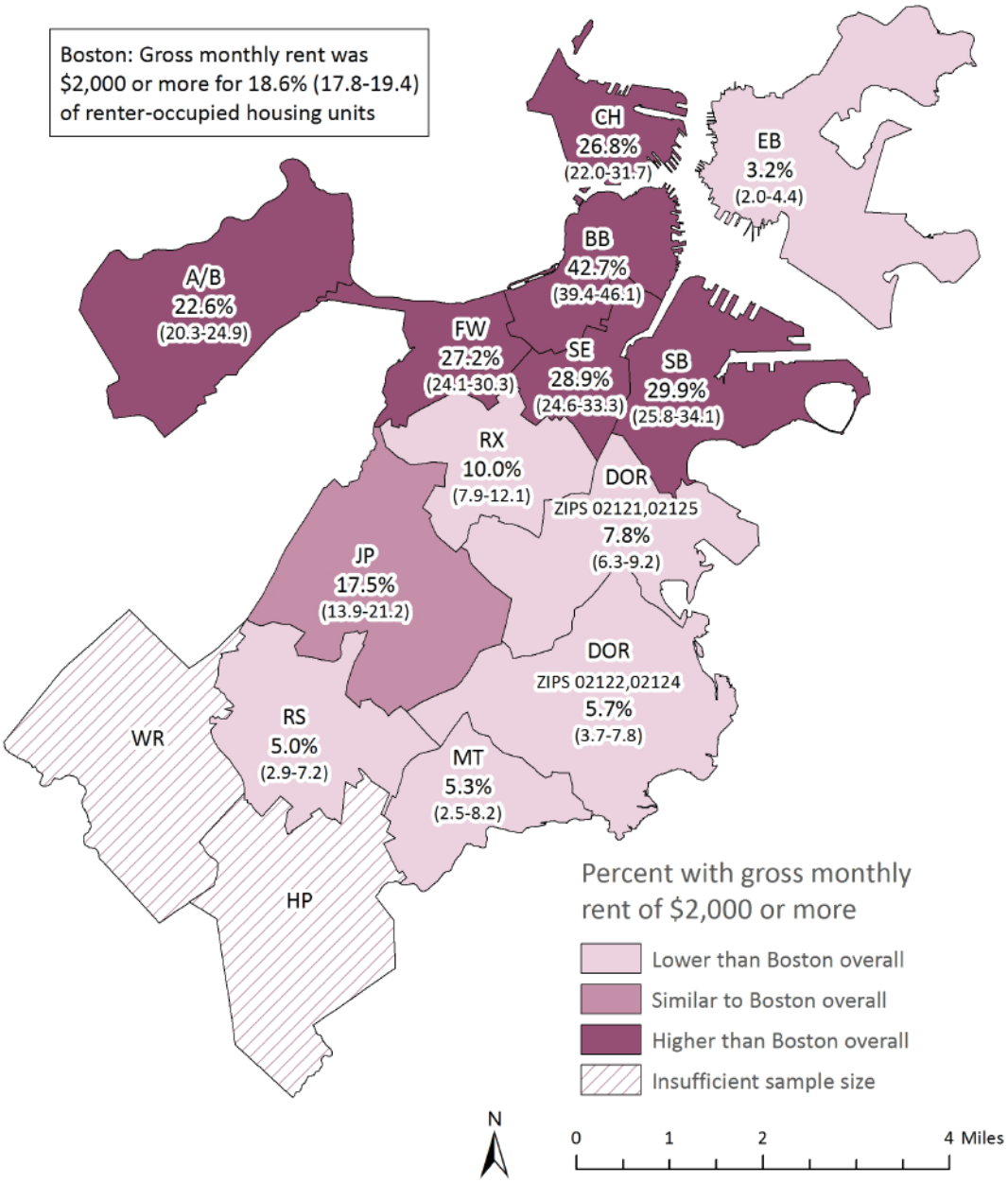


[1] Includes average monthly utility costs

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 49% of Boston renters lived in units with gross monthly rent between $1,000-$1,999. Compared with White residents (42%), a lower percentage of Asian (23%), Black (13%), and Latino (15%) residents paid $2,000 or more in rent per month.

Figure 2.44 Gross Monthly Rent[1] of $2,000 or More by Neighborhood, 2011-2015



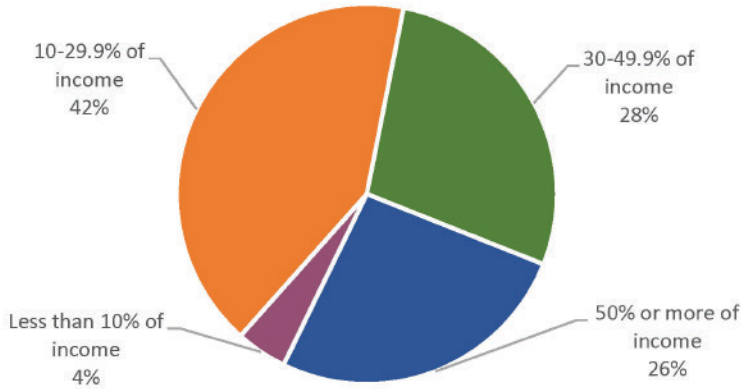
[1] Includes average monthly utility costs

NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End. "SE" includes the South End and Chinatown.

DATA SOURCE: American Community Survey, 2011-2015, U.S. Census Bureau

During 2011-2015 combined, 19% of households who paid rent in Boston had a gross rent of $2,000 or more per month. Compared with Boston overall, a higher percentage of renter-occupied households in Allston/ Brighton, Back Bay, Charlestown, Fenway, South Boston, and the South End paid $2,000 or more per month in rent. A lower percentage of renter-occupied households in Dorchester (zip codes 02121, 02125), Dorchester (zip codes 02122, 02124), East Boston, Mattapan, Roslindale, and Roxbury paid $2,000 or more per month in rent compared with Boston overall.

Figure 2.45 Gross Monthly Rent[1] as a Percentage of Household Income, 2015

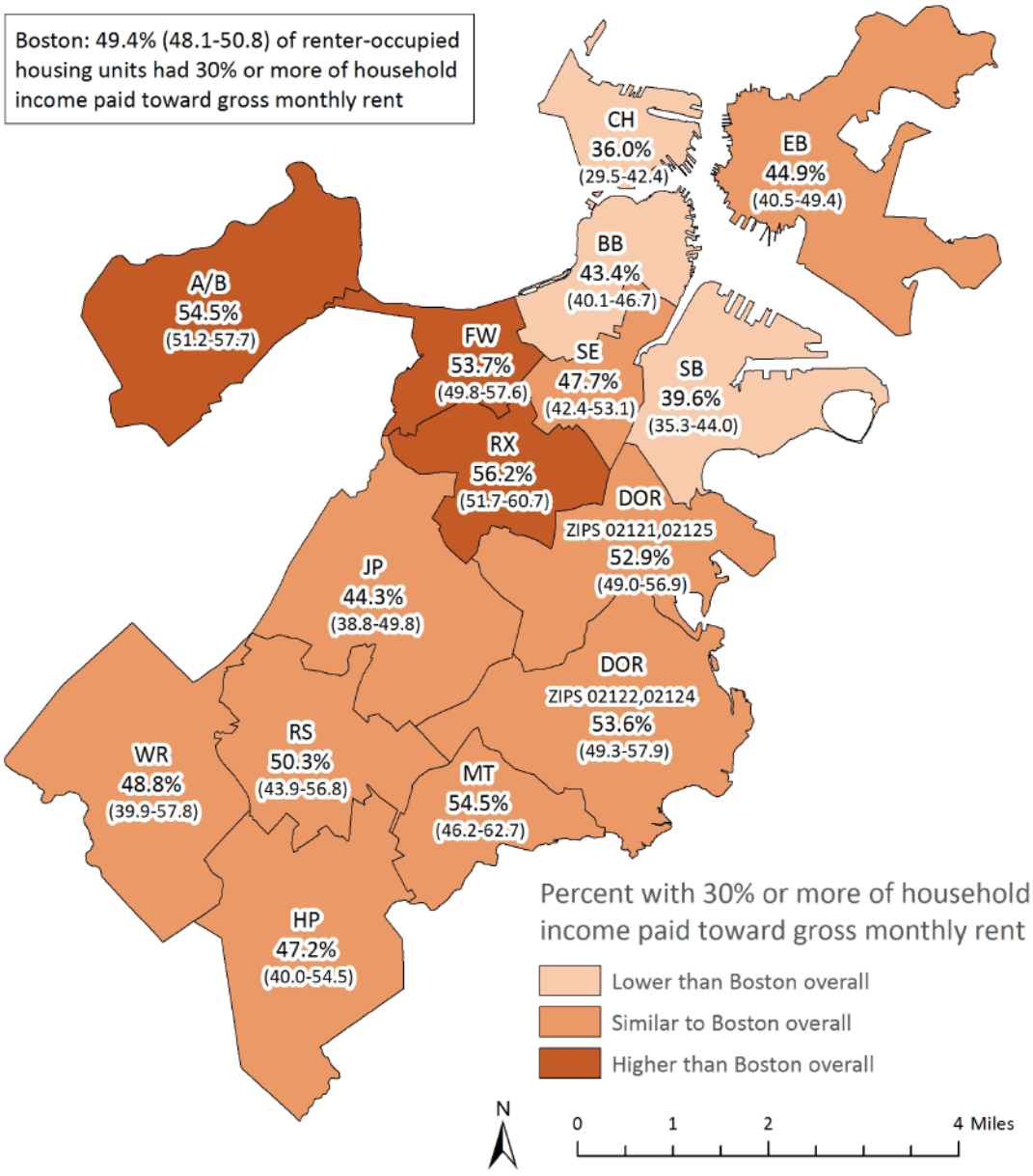


[1] Includes average monthly utility costs

NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey, 2015, U.S. Census Bureau

In 2015, 26% of Boston residents paid 50% or more of their household income in rent. For 28% of Boston residents, rent was 30-49.9% of their household income.

Figure 2.46 30% or More of Household Income Paid Toward Gross Monthly Rent[1] by Neighborhood, 2011-2015



[1]Includes average monthly utility costs

NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End. "SE" includes the South End and Chinatown.

DATA SOURCE: American Community Survey, 2011-2015, U.S. Census Bureau

During 2011-2015, 49% of households who paid rent in Boston paid at least 30% of their income toward gross rent. Compared with Boston overall, a higher percentage of renter-occupied households in Allston/Brighton, Fenway, and Roxbury paid at least 30% of their income toward rent. A lower percentage of renter-occupied households in Back Bay, Charlestown, and South Boston paid at least 30% of their income toward rent.

Figure 2.47 Foreclosure Petitions by Neighborhood, 2012-2016

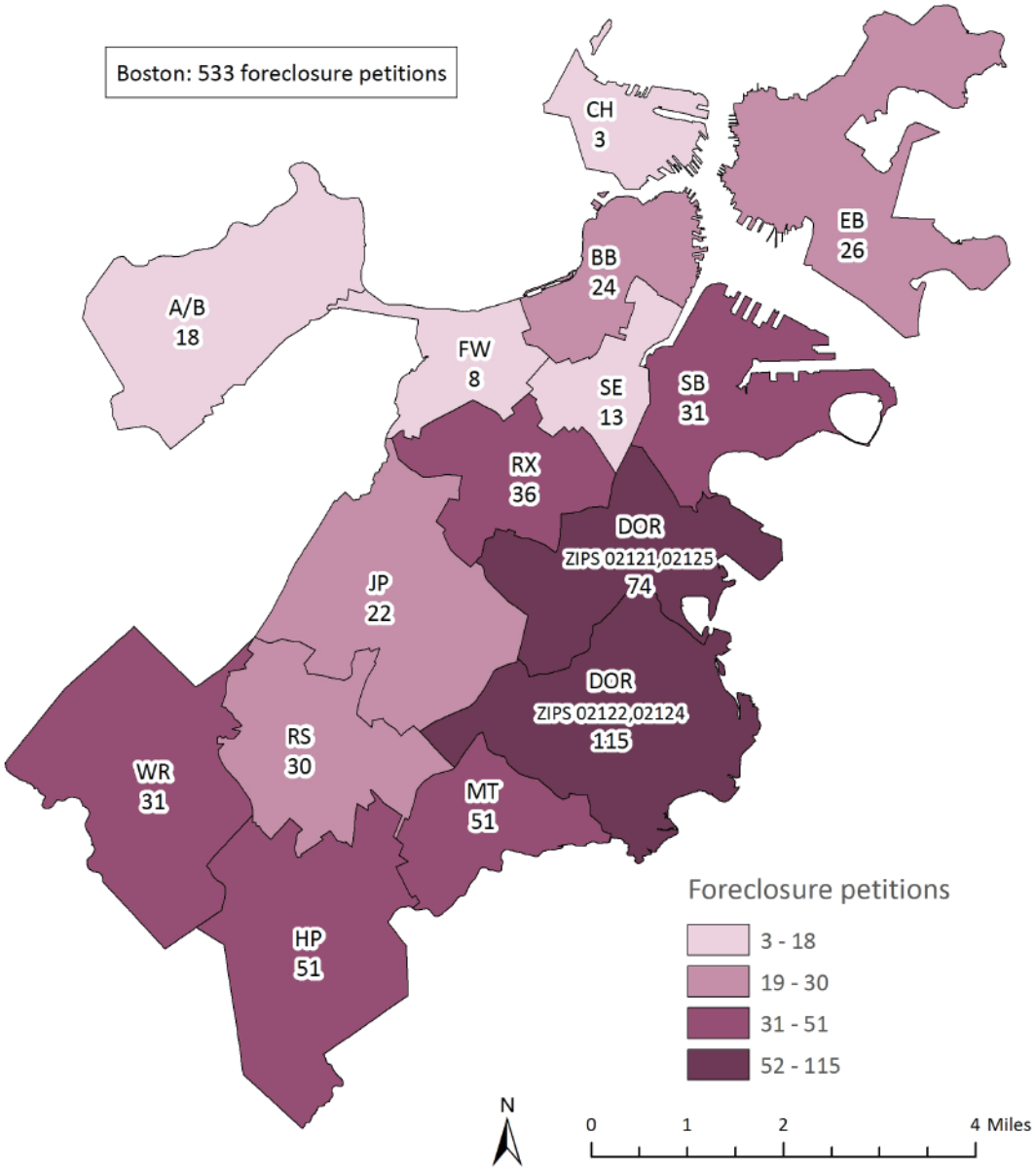
	2012	2013	2014	2015	2016	Average 2012-2016	% decrease from 2012-2016
Boston	890	232	322	500	533	495	40%
Allston/Brighton	31	7	13	14	18	17	42%
Back Bay[1]	37	5	8	18	24	18	35%
Charlestown	11	1	5	6	3	5	73%
Dorchester (zip codes 02121, 02125)	108	24	43	69	74	64	31%
Dorchester (zip codes 02122, 02124)	177	55	91	110	115	110	35%
East Boston	61	14	8	14	26	25	57%
Fenway	13	2	2	4	8	6	38%
Hyde Park	103	32	32	61	51	56	50%
Jamaica Plain	29	9	16	15	22	18	24%
Mattapan	90	26	32	56	51	51	43%
Roslindale	58	13	20	29	30	30	48%
Roxbury	54	12	15	45	36	32	33%
South Boston	45	8	19	24	31	25	31%
South End[2]	23	7	5	10	13	12	43%
West Roxbury	50	17	13	25	31	27	38%

[1] Includes Beacon Hill, Downtown, the North End, and the West End
[2] Includes Chinatown

DATA SOURCE: Residential foreclosure petitions, Warren Group
DATA ANALYSIS: Department of Neighborhood Development, City of Boston

A foreclosure petition is the first step in the foreclosure process of a home. In Boston in 2016, there were 533 foreclosure petitions, a decrease of 40% from 2012. Foreclosure petitions decreased in all neighborhoods from 2012 to 2016.

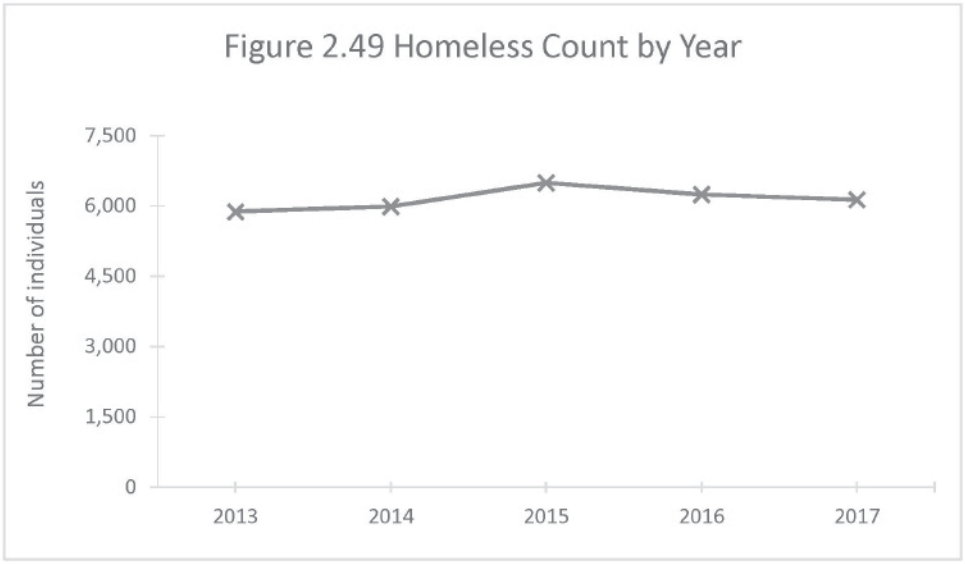
Figure 2.48 Foreclosure Petitions, 2016



NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.
"SE" includes the South End and Chinatown.

DATA SOURCE: Residential foreclosure petitions, Warren Group
DATA ANALYSIS: Department of Neighborhood Development, City of Boston

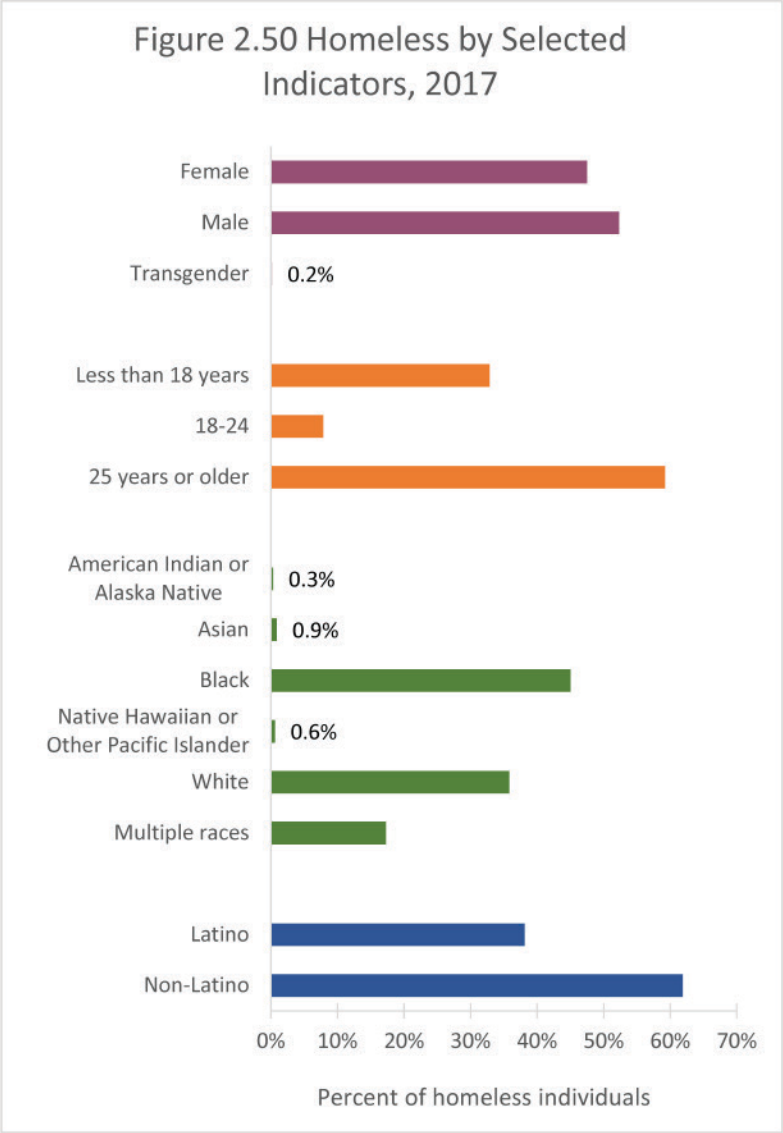
A foreclosure petition is the first step in the foreclosure process of a home. In 2016, there were 533 foreclosure petitions in Boston. Dorchester (zip codes 02122, 02124) had the highest number of foreclosure petitions (115), while Charlestown had the lowest number (3).



DATA SOURCE: Boston Continuum of Care (CoC) Homeless Assistance Programs Dashboard Reports, 2013-2017, U.S. Department of Housing and Urban Development

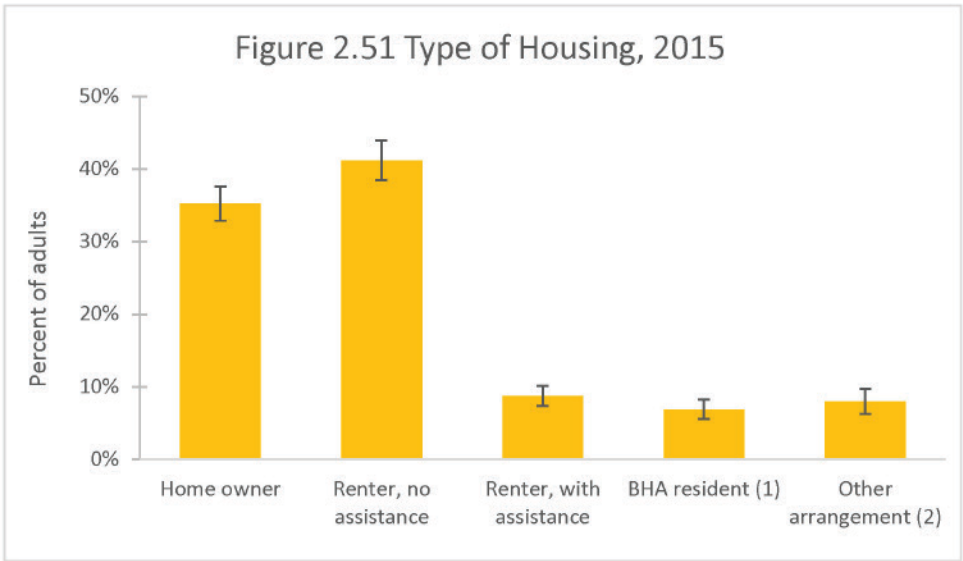
In 2013, 5,881 homeless individuals were counted in Boston during the annual homeless census, while in 2017, there were 6,135 homeless individuals counted.

In 2017, 6,135 homeless individuals were counted on the night of January 25th, 2017 during the annual homeless census. Forty-eight percent were female, 33% were under the age of 18, 17% identified as more than one race, and 38% identified as Latino.



NOTE: Racial (American Indian or Alaska Native, Asian, etc.) and ethnic (Latino/non-Latino) indicators are not mutually exclusive.
DATA SOURCE: Boston Continuum of Care (CoC) Homeless Assistance Programs Dashboard Reports, 2017, U.S. Department of Housing and Urban Development

In 2015, 35% of Boston residents were homeowners, 41% rented their homes without rental assistance, 9% rented with rental assistance, 7% were BHA residents, and 8% had some other housing arrangement.



(1) Boston Housing Authority resident
(2) "Other arrangement" may include a group home, staying with friends or family without paying rent, or other housing status.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

Figure 2.52 Health Indicators by Housing Status, 2013 and 2015 Combined

	Boston Housing Authority resident	Renter, with assistance	Renter, no assistance	Other arrangement	Home owner
Asthma	20.1%* (15.6-25.5)	21.4%* (17.1-26.5)	10.4% (8.8-12.3)	11.8% (7.4-18.2)	9.1% (7.7-10.7)
Diabetes	17.7%* (13.8-22.5)	15.6%* (12.7-18.9)	6.2%* (5.2-7.4)	5.6% (3.2-9.7)	8.4% (7.4-9.5)
Hypertension	38.2%* (32.6-44.2)	37.5%* (32.7-42.6)	17.5%* (15.7-19.5)	17.3%* (12.8-23.1)	28.3% (26.3-30.4)
Obesity	33.9%* (28.3-40.0)	35.4%* (30.6-40.6)	18.6% (16.6-20.8)	21.6% (15.9-28.8)	20.5% (18.6-22.6)
Persistent anxiety	22.2%* (17.6-27.7)	35.4%* (30.6-40.6)	23.4%* (20.8-26.2)	19.2% (14.1-25.7)	15.9% (14.0-17.9)
Persistent sadness	20.7%* (16.2-26.0)	25.7%* (21.1-30.9)	12.5%* (10.6-14.6)	12.2%* (8.3-17.6)	5.7% (4.9-6.8)

* Statistically significant difference when compared to reference group (home owner)

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

This table describes select health indicators by housing status. Compared with homeowners, higher percentages of Boston Housing Authority residents and renters receiving rental assistance had asthma, diabetes, hypertension, obesity, persistent anxiety, and persistent sadness. These percentages remained higher after adjusting for age, race/ethnicity, and sex (adjusted data not shown).

Compared with homeowners, a higher percentage of renters who did not receive rental assistance had persistent anxiety and persistent sadness. These percentages remained higher after adjusting for age, race/ethnicity, and sex (adjusted data not shown). Conversely, a lower percentage of renters who did not receive rental assistance had diabetes and hypertension compared with homeowners, but these differences were no longer evident after adjusting for age, race/ethnicity, and sex (adjusted data not shown).

A higher percentage of those who had other housing arrangements had persistent sadness and a lower percentage had hypertension compared with homeowners. These differences remained after adjusting for age, race/ethnicity, and sex (adjusted data not shown).

Housing Summary

In 2015, two-thirds of housing units in Boston were occupied by renters, and one-third were occupied by owners. Boston has a higher percentage of renter-occupied units and a lower percentage of owner-occupied housing units compared with Massachusetts overall. We identified differences in housing occupancy by race/ethnicity, neighborhood, and education level. Compared with White residents, a higher percentage of Asian, Black, and Latino residents lived in renter-occupied units. During 2011-2015, a higher percentage of housing units in Allston/Brighton, Dorchester (zip codes 02121, 02125), East Boston, Fenway, and Roxbury were renter-occupied compared with Boston overall, while a lower percentage of housing units were renter-occupied in Charlestown, Dorchester (zip codes 02122, 02124), Hyde Park, Jamaica Plain, Mattapan, Roslindale, South Boston, and West Roxbury compared with Boston overall. In 2015, a higher percentage of Boston residents living in renter-occupied units had less than a high school education and a higher percentage paid about one-third of their income towards housing compared with residents in owner-occupied units. Those putting more than 30% of their income towards housing are considered "cost burdened" by the U.S. Department of Housing and Urban Development, and may have difficulty affording necessities such as food, clothing, and transportation.

In 2015, the median gross rent for a householder moving into a unit in 2015 or later was $1,876, about double what is was if a householder moved into a unit between 1980-1989. We found inequities in what residents are paying for rent by race/ethnicity and neighborhood. Compared with White residents who rent, a lower percentage of Asian, Black, and Latino residents who rented paid $2,000 or more in rent per month. In 2015, about a quarter of Boston residents paid 50% or more of their household income in rent. During 2011-2015, half of Boston residents living in renter-occupied housing units paid at least 30% of their income towards rent. Compared with Boston overall, a higher percentage of residents in Allston/Brighton, Fenway, and Roxbury paid at least 30% of their income towards rent. A lower percentage of residents in Back Bay, Charlestown, and South Boston paid at least 30% of their income towards rent.

We also looked at health indicators by housing status. In 2015, 35% were homeowners, 41% rented their homes without rental assistance, 9% rented with rental assistance, 7% were Boston Housing Authority (BHA) residents, and 8% had some other housing arrangement. After adjusting for differences in age, race/ethnicity, and sex, we found differences in several health outcomes by housing status. Compared with homeowners, a higher percentage of BHA residents and renters receiving rental assistance had asthma, diabetes, hypertension, obesity, persistent anxiety, and persistent sadness. A higher percentage of renters who did not receive assistance had persistent anxiety and persistent sadness than homeowners. Lastly, a higher percentage of those who had housing arrangements other than renting (with and without rental assistance), being a homeowner, or being a BHA resident, had hypertension and persistent sadness than homeowners.

Housing status and chronic conditions in 2013 and 2015 combined:

	Boston Housing Authority (BHA) residents	Renters who received rental assistance	Homeowners
Asthma	20%	21%	9%
Diabetes	18%	16%	8%
Hypertension	38%	38%	28%
Obesity	34%	35%	21%
Persistent anxiety	22%	35%	16%
Persistent sadness	21%	26%	6%

Health of Boston 2016-2017

Bias and Racism

Just as the social determinants of health impact a person's environment and behavior, racism impacts the social determinants of health (55). Differences in health outcomes are not generally caused by race but by racism, and specifically how racism impacts the social determinants of health (56).

Racism can take many forms, ranging from interpersonal interactions to institutional/structural policies and practices. Although the expression of outright discrimination has declined in recent decades, the residual effects from historically discriminatory policies now shape subtler, unconscious, and nuanced forms of racism at the structural, institutional, interpersonal, and internalized levels. Decades of research indicate that systemic racism negatively affects health in the U.S. (57). Understanding the many pathways through which racism permeates our community will enable us to address racial inequities in health outcomes that are apparent today.

At the *structural level,* racism can be perpetuated through a system of selectively allocated social privilege. A commonly cited example of structural racism is evident in the interaction between Black individuals and the criminal justice system (58). Although White individuals are more likely to use drugs compared with Black individuals, Black individuals are more likely to enter the criminal justice system for drug-related offenses—an inequity which has lifelong consequences for the individual, family, and community (59). A study found that White individuals with a recent criminal record fared better in the New York City job market than Black individuals who had the same resumes but no criminal record (58).

Economic and employment opportunities, access to resources such as housing and education, and social capital are a few examples of necessities that become virtually inaccessible once an individual interacts with the criminal justice system. Lack of access to these necessities, in turn, may exacerbate health inequities.

At the *institutional level*, organizational policies and practices affect access to goods, services, and opportunities. Within the healthcare system, studies have demonstrated that Black patients are less likely to receive the appropriate care compared with White patients. In one study, Black and White actors portrayed patients with coronary heart disease (60). Physicians were less likely to recommend standard cardiac catheterization for Black patients as compared with Whites patients (60). Other studies have found that Black patients are less likely to receive transplants than Whites patients. One group of researchers have reasoned that physicians possess "subconscious bias" when delivering care (61).

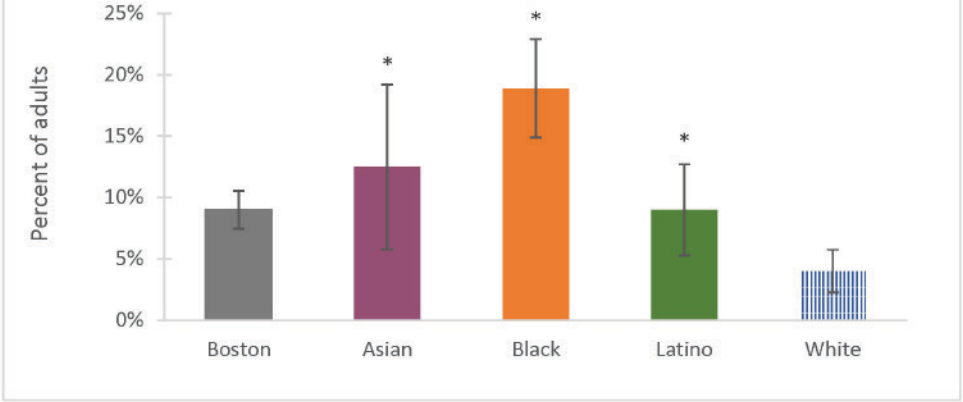
At the *interpersonal level*, prejudice, discrimination, and bias can affect the way people of all races/ethnicities perceive and interact with each other, both intentionally and unintentionally. For example, within the patient-provider relationship, perceived racism is associated with less positive interactions and decreased ease of conversation over the course of care (62).

Internalized racism occurs when individuals begin to absorb the discriminatory messages they are often bombarded with. This can lead to feelings of inferiority and low self-esteem (63). In the late 1930s and early 1940s, a well-known study found that when a child as young as age 3 was presented with two identical dolls, except one had white skin and blond hair and the other had brown skin and black hair, both Black and White children had more positive attitudes towards the white doll when asked questions such as, "Which is the nice doll?", "Which one has the nicer color?", and "Which doll looks bad?" (64). When replicated in 2005, this study produced similar results to the original study. Again, the majority of children, both Black and White, preferred the white doll (65).

Perpetual exposure to racism and discrimination increase stress hormones that lead to increases in blood pressure and heart rate (66-68). The combination of chronic stress with other social disadvantages, such as low income, can contribute to many health conditions, including heart disease, depression, hypertension, obesity, and elevated blood sugar (66-68). Negative coping mechanisms related to marginalization or discrimination further impact health. Behaviors reportedly used to reduce feelings of stress include the use of tobacco, alcohol, and other harmful substances, as well as poor eating or sleeping patterns (66, 67).

Racism at the structural, institutional, interpersonal, and internalized levels influence health experiences, behaviors, and outcomes for individuals and communities. Efforts to address racial/ethnic health inequities must include mechanisms to dismantle racism at every level and to counteract its impact on health.
This section presents data on individuals who experienced emotional and physical symptoms as a result of being treated differently because of their race as well as health indicators related to these issues.

Figure 2.53 Adults Who Felt Emotionally Upset by Perceived Race-Related Treatment in the Past 30 Days by Race/Ethnicity, 2015



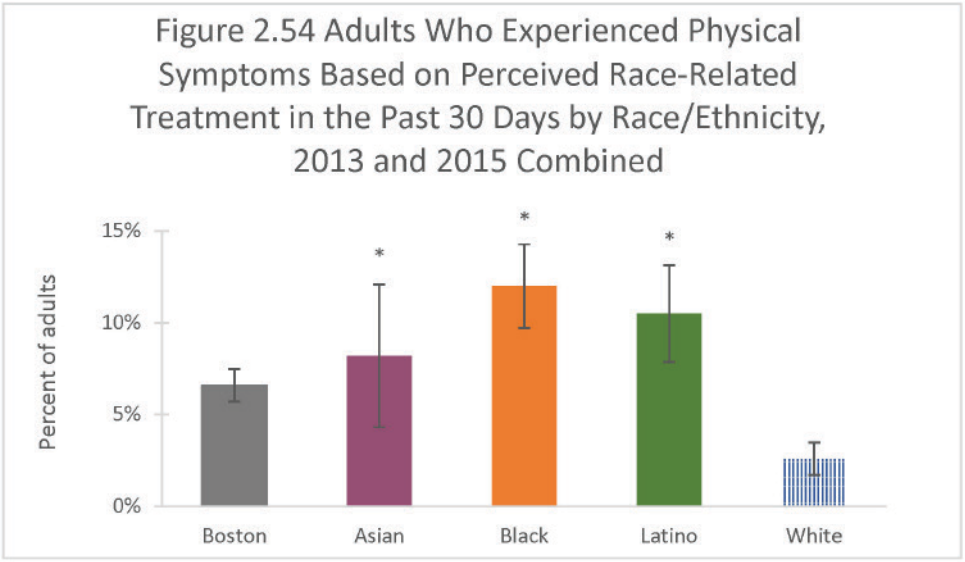
* Statistically significant difference when comparisons are made between racial/ethnic groups

NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

In 2015, 9% of Boston adult residents felt emotionally upset because of how they were treated based on their race in the past 30 days. A higher percentage of Asian, Black, and Latino residents were emotionally upset in the past 30 days, 13%, 19% and 9%, respectively, compared with White residents, 4%.

During 2013 and 2015 combined, 7% of Boston adult residents experienced physical symptoms in the past 30 days as a result of how they were treated based on their race. Compared with White residents (3%), a higher percentage of Asian (8%), Black (12%), and Latino (11%) residents reported experiencing physical symptoms in the past 30 days.

Figure 2.54 Adults Who Experienced Physical Symptoms Based on Perceived Race-Related Treatment in the Past 30 Days by Race/Ethnicity, 2013 and 2015 Combined

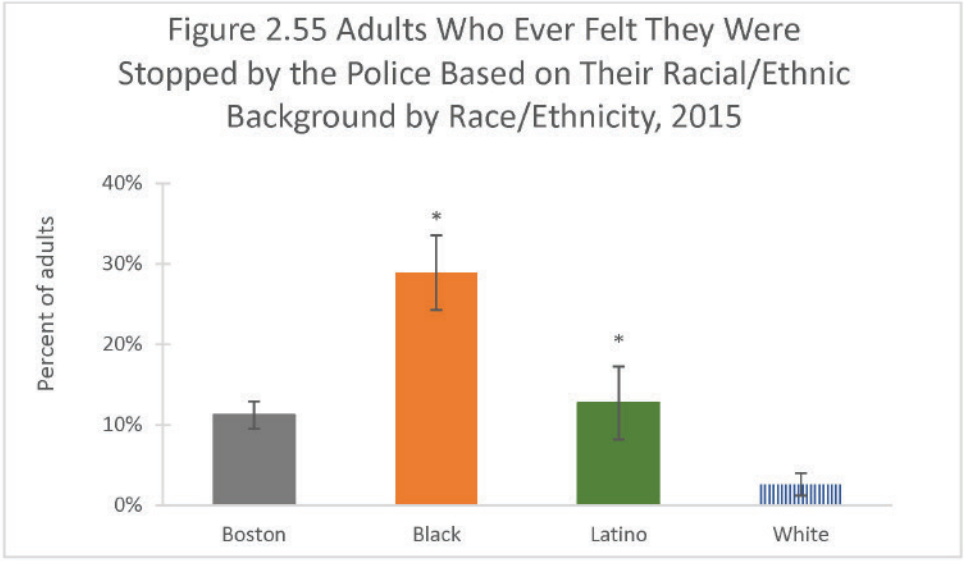


* Statistically significant difference when comparisons are made between racial/ethnic groups

NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

In 2015, 11% of Boston adult residents felt they were stopped by the police just because of their race or ethnic background. Compared with White residents (3%), a higher percentage of Black and Latino residents, 29% and 13% respectively, reported they felt they were stopped by the police just because of their race or ethnic background.

Figure 2.55 Adults Who Ever Felt They Were Stopped by the Police Based on Their Racial/Ethnic Background by Race/Ethnicity, 2015



* Statistically significant difference when comparisons are made between racial/ethnic groups

NOTE: Bars with patterns indicate the reference group within each selected indicator. Data not presented due to insufficient sample size for Asian residents.
DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

Figure 2.56 Health Indicators Among Adults Who Felt Emotionally Upset by Perceived Race-Related Treatment in the Past 30 Days, 2015

Health Indicator	Among those who were emotionally upset within past 30 days	Among those who were not emotionally upset within past 30 days
Asthma	14.8% (9.8-21.7)	11.8% (10.1-13.7)
Diabetes	10.7% (7.0-16.1)	8.0% (6.9-9.2)
Hypertension	24.7% (18.6-32.1)	24.9% (22.9-27.0)
Obesity	21.2% (15.1-28.8)	22.0% (19.9-24.3)
Persistent anxiety	39.1%* (30.8-47.9)	20.8% (18.4-23.3)
Persistent sadness	30.0%* (22.5-38.8)	10.2% (8.7-12.0)

* Statistically significant difference

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

This table describes select health indicators by whether an individual felt emotionally upset as a result of how they were treated based on their race. A higher percentage of adult residents who felt emotionally upset within the past 30 days by perceived race-related treatment had persistent anxiety and persistent sadness compared with those who did not feel emotionally upset. These percentages remained higher after adjusting for age, race/ethnicity, and sex (adjusted data not shown).

Figure 2.57 Health Indicators Among Adults Who Experienced Physical Symptoms Based on Perceived Race-Related Treatment in the Past 30 Days, 2015

Health Indicator	Among those who experienced physical symptoms within past 30 days	Among those who did not experience physical symptoms within past 30 Days
Asthma	12.2% (7.5-19.3)	11.9% (10.3-13.8)
Diabetes	10.4% (6.2-17.0)	8.1% (7.1-9.3)
Hypertension	26.8% (19.0-36.5)	24.6% (22.7-26.7)
Obesity	24.5% (16.4-34.9)	21.7% (19.6-24.0)
Persistent anxiety	26.5%* (17.7-37.7)	11.0% (9.4-12.7)
Persistent sadness	36.0%* (25.9-47.6)	21.4% (19.2-23.9)

* Statistically significant difference

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

This table describes select health indicators by whether an individual experienced physical symptoms as a result of how they were treated based on their race. A higher percentage of adult residents who experienced physical symptoms within the past 30 days had persistent anxiety and persistent sadness compared with those who did not experience physical symptoms. These percentages remained higher after adjusting for age, race/ethnicity, and sex (adjusted data not shown).

This table describes select health indicators by whether an individual felt they were stopped by the police just because of their race or ethnic background. A higher percentage of adult residents who felt they were stopped by the police just because of their race or ethnic background had persistent anxiety and persistent sadness compared with those who did not feel they were stopped by the police for these reasons. These percentages remained higher after adjusting for age, race/ethnicity, and sex (adjusted data not shown).

Figure 2.58 Health Indicators Among Adults Who Ever Felt They Were Stopped by the Police Based on Their Racial/Ethnic Background, 2015

Health Indicator	Among those who felt they were stopped by police based on their racial/ethnic background	Among those who did not feel they were stopped by police based on their racial/ethnic background
Asthma	14.9% (10.4-20.9)	11.8% (10.0-13.7)
Diabetes	9.8% (6.6-14.2)	7.9% (6.8-9.1)
Hypertension	28.1% (21.9-35.2)	24.5% (22.4-26.6)
Obesity	24.2% (18.6-30.7)	21.7% (19.5-24.1)
Persistent anxiety	33.3%* (25.9-41.5)	20.8% (18.5-23.3)
Persistent sadness	25.3%* (18.5-33.6)	10.1% (8.6-11.7)

* Statistically significant difference

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

Racism Summary

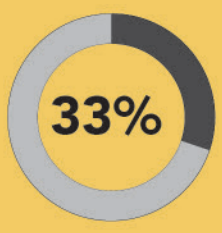
The racism experienced at the structural, institutional, interpersonal, and internalized levels influences a person's behaviors, and therefore their health. This impacts their personal health outcomes and those of their community. In 2015, a higher percentage of Asian, Black, and Latino residents were emotionally upset and experienced physical symptoms in the past 30 days because of how they were treated based on their race compared with White residents.

Additionally, compared with White residents, a higher percentage of Black and Latino residents reported they felt they were stopped by the police just because of their race or ethnic background. After adjusting for differences in age, race/ethnicity, and sex, a higher percentage of those who felt they were stopped by the police just because of their race or ethnic background had persistent anxiety and persistent sadness compared with those who did not feel they were stopped by the police because of their race or ethnic background. To end racial/ethnic health inequities, efforts must include ways to eliminate racism at all levels.

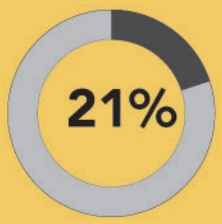
Racial bias and health in 2015:

10 times as many Black residents reported they felt they were stopped by the police just because of their race or ethnic background compared to White residents

Persistent anxiety:

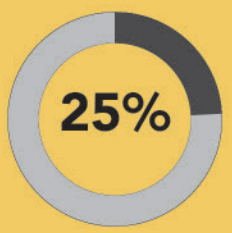


among residents who felt they were stopped by the police based on their racial/ethnic background

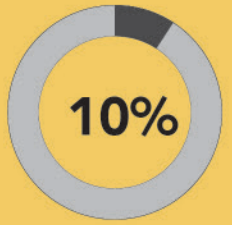


among residents who did not feel they were stopped by the police based on their racial/ethnic background

Persistent sadness:



among residents who felt they were stopped by the police based on their racial/ethnic background



among residents who did not feel they were stopped by the police based on their racial/ethnic background

Health of Boston 2016-2017

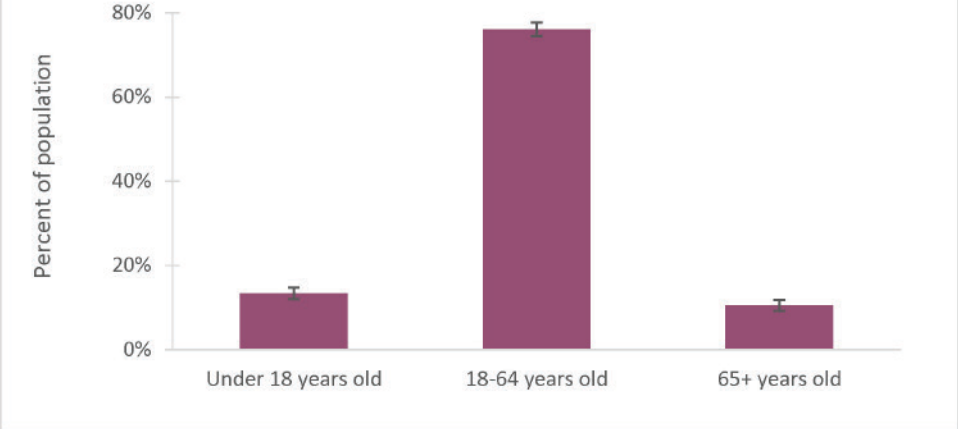
Social Determinants of Health by Race/Ethnicity

This section shows demographic data and the social determinants of health (such as education, employment, income, and housing) by race/ethnicity for Boston residents.

Asian Residents

In 2015, 13% of Asian residents were under 18, 76% were ages 18-64, and 11% were ages 65 and older.

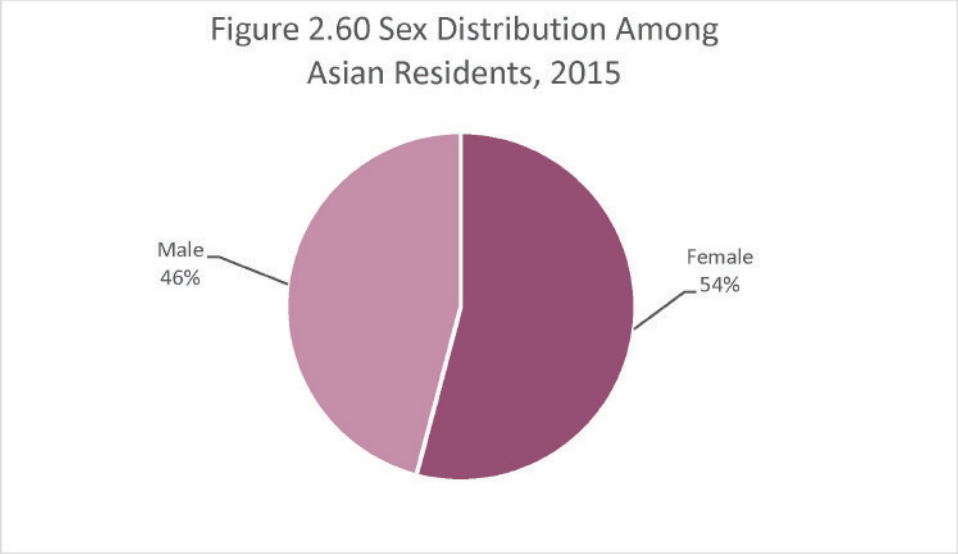
Figure 2.59 Age Distribution Among Asian Residents, 2015



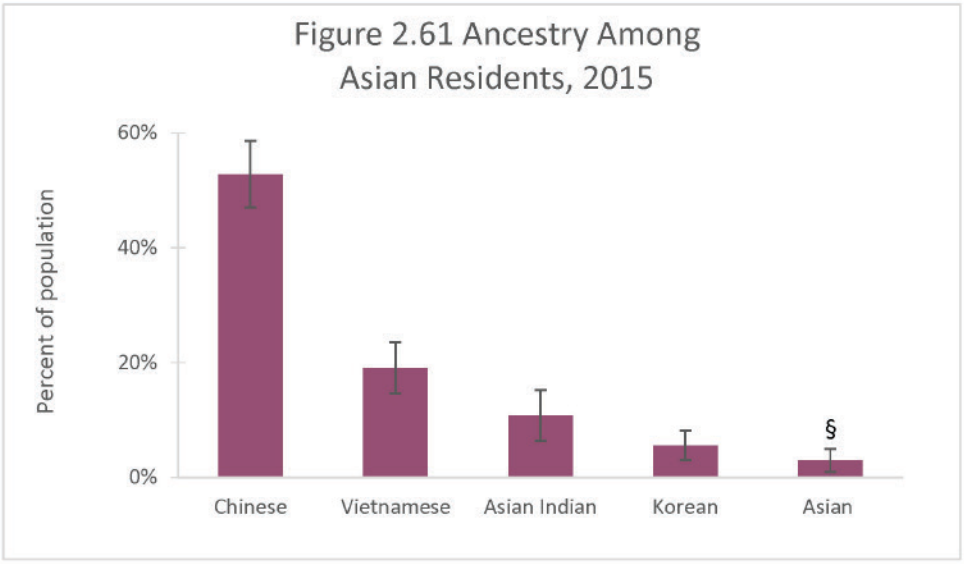
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 54% of Asian residents were female and 46% were male.

Figure 2.60 Sex Distribution Among Asian Residents, 2015



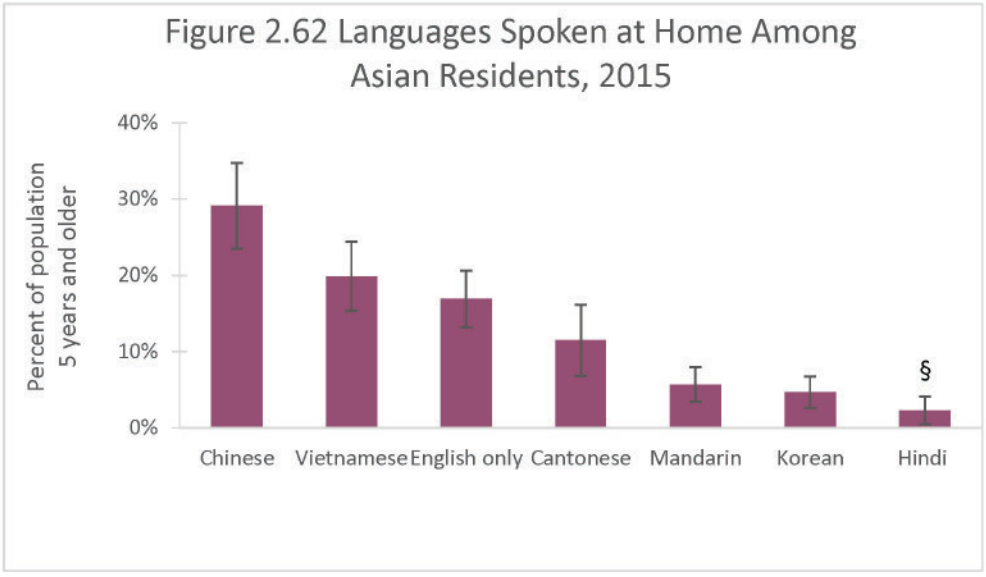
NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau



§ Estimates have a coefficient of variation greater than 30% and should be interpreted with caution.

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, a majority of Asian residents were of Chinese ancestry (53%). Other reported ancestries included Vietnamese (19%), Asian Indian (11%), Korean (6%), and Asian (3%).

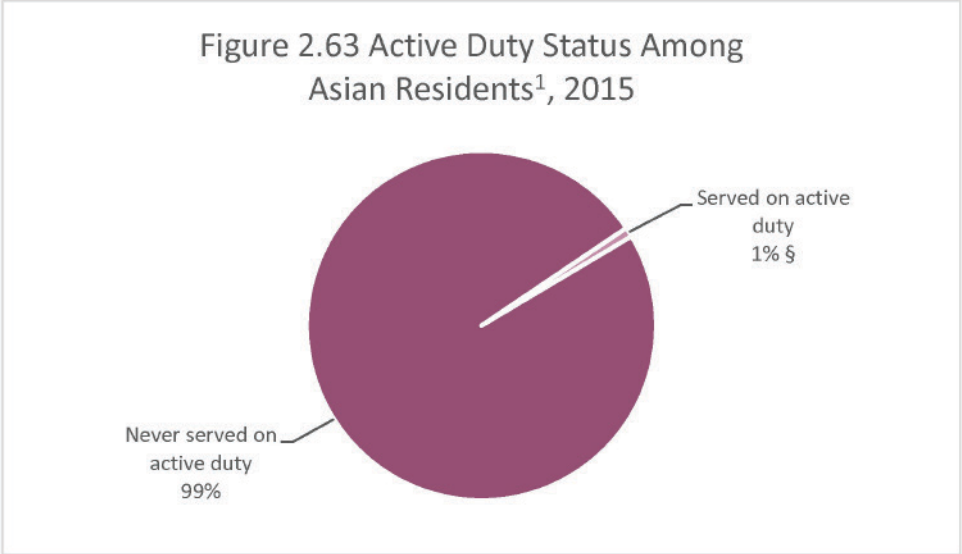


§ Estimates have a coefficient of variation greater than 30% and should be interpreted with caution.

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

Chinese (29%) was the language most frequently spoken at home among Asian residents ages 5 and older. Vietnamese was spoken at home by 20% of Asian residents, while 17% spoke English only, 12% spoke Cantonese, 6% spoke Mandarin, 5% spoke Korean, and 2% spoke Hindi.

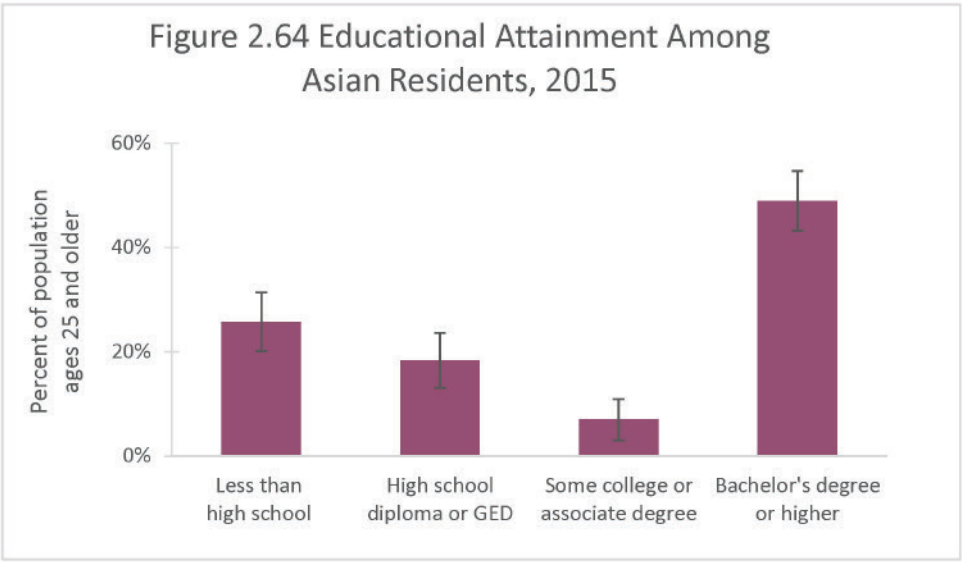
In 2015, approximately 1% of Asian residents ages 17 and older had ever served on active duty in the military.



§ Estimates have a coefficient of variation greater than 30% and should be interpreted with caution.
[1] Population ages 17 and older

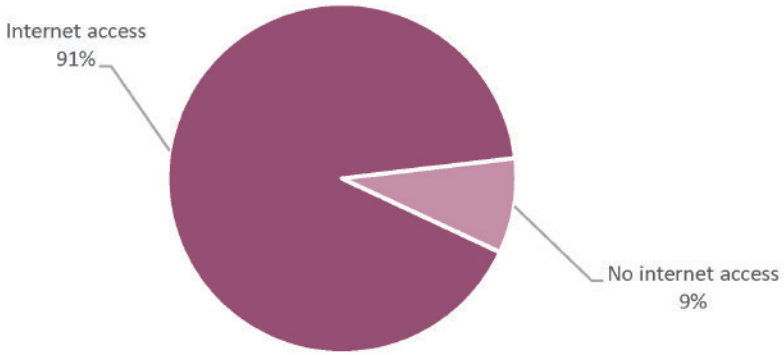
NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 26% of Asian residents ages 25 and older had less than a high school diploma, 18% had a high school diploma or GED, 7% had some college education or an associate degree, and 49% had a bachelor's degree or higher.



DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

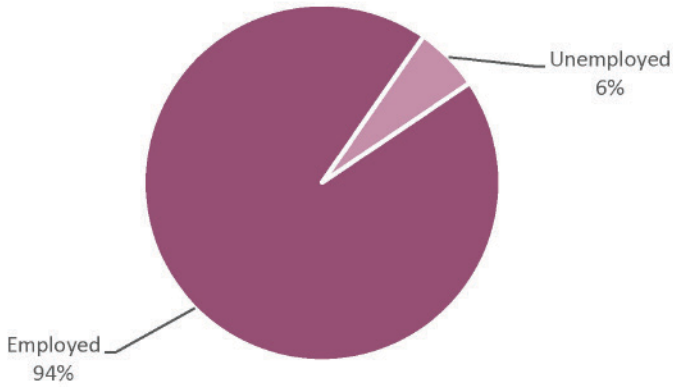
Figure 2.65 Internet Access Among Asian Residents, 2015



NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 91% of Asian residents had access to the internet at home.

Figure 2.66 Employment Among Asian Residents[1], 2015

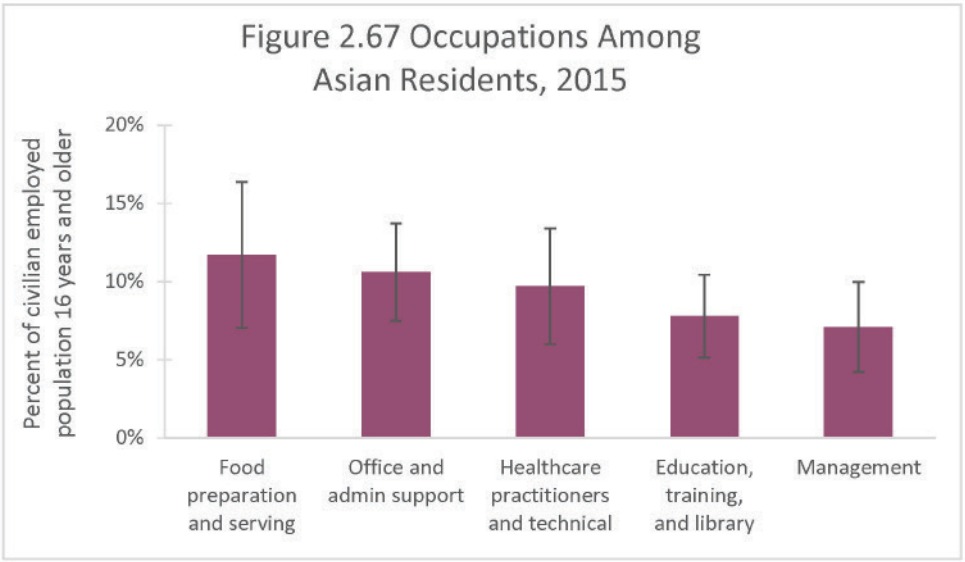


[1] Civilian population ages 16 and older in the labor force

NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 6% of Asian residents ages 16 and older were unemployed.

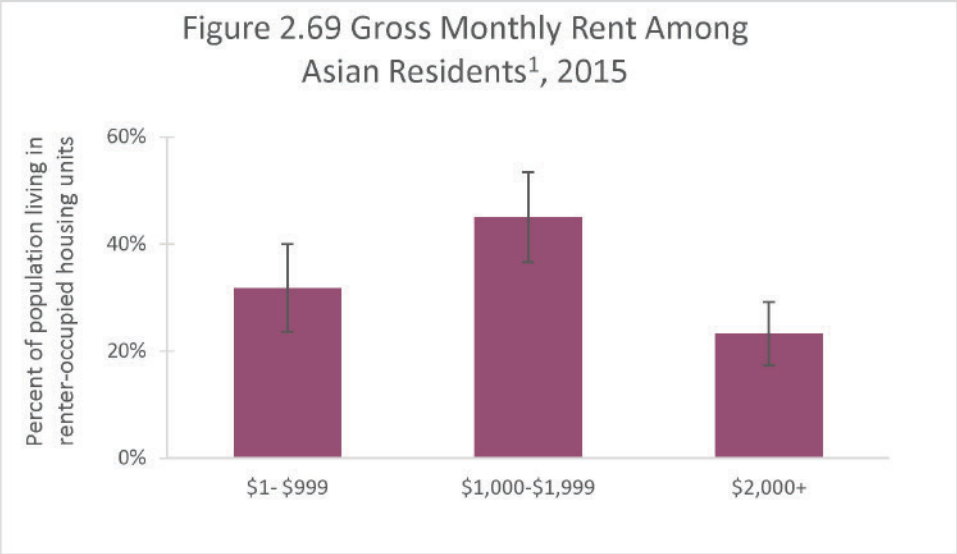
In 2015, the most commonly held occupations among employed Asian residents ages 16 and older were food preparation and serving (12%), office and administrative support (11%), healthcare practitioners and technical occupations (10%), education, training, and library (8%), and management (7%).



DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 50% of Asian residents in Boston had a household income of $50,000 or more. Thirty-one percent had a household income of less than $25,000 and 19% had a household income of $25,000-$49,999.

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau



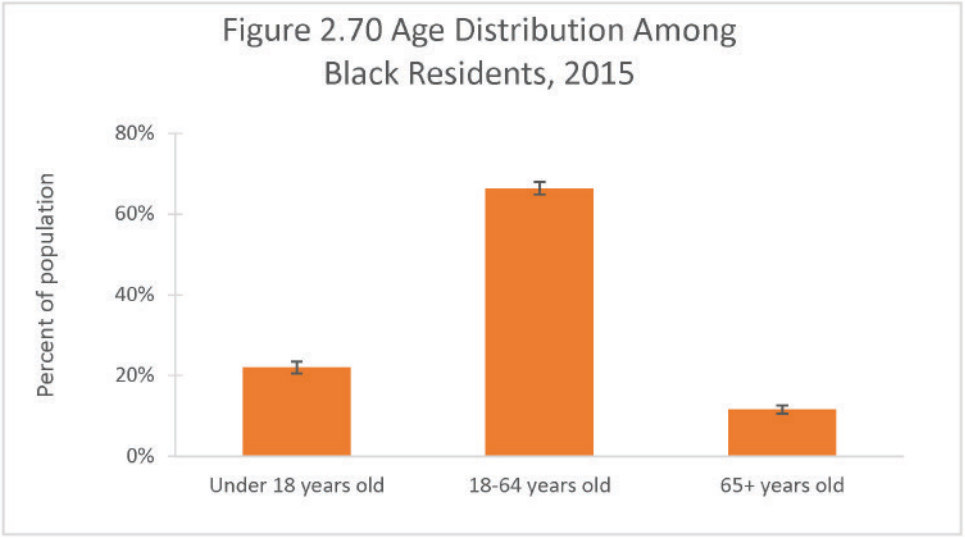
[1] Includes residents receiving governmental rental assistance

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 45% of Asian residents living in renter-occupied housing units paid $1,000-$1,999 in gross monthly rent. Thirty-two percent paid $1-$999 in gross monthly rent and 23% paid $2,000 or more in gross monthly rent.

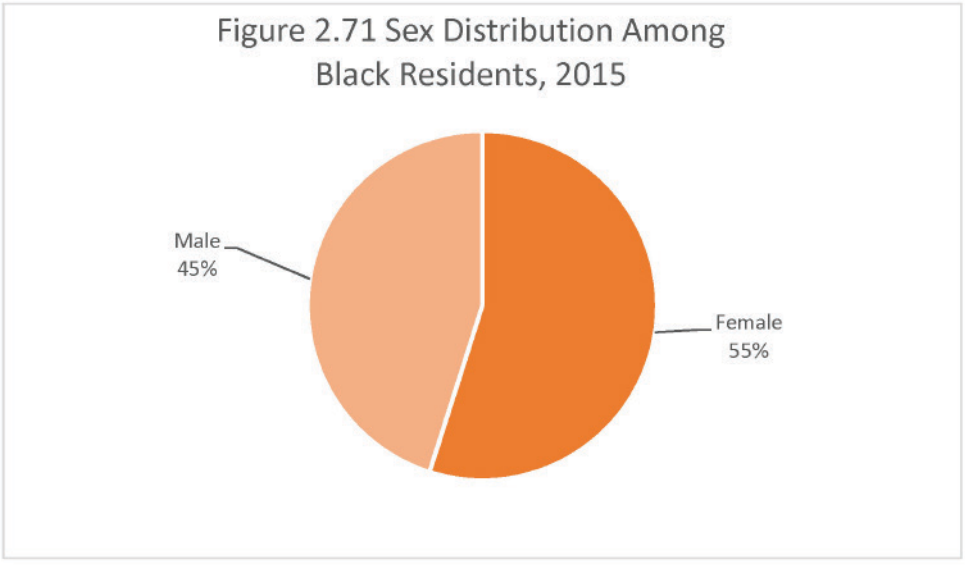
Black Residents

In 2015, 22% of Black residents were under 18, 66% were ages 18-64, and 12% were ages 65 and older.

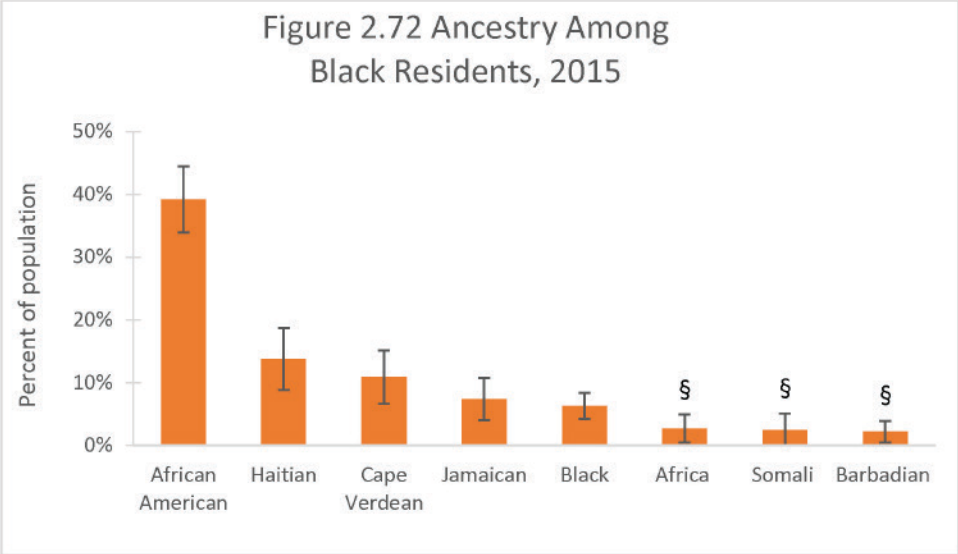


DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 55% of Black residents were female and 45% were male.



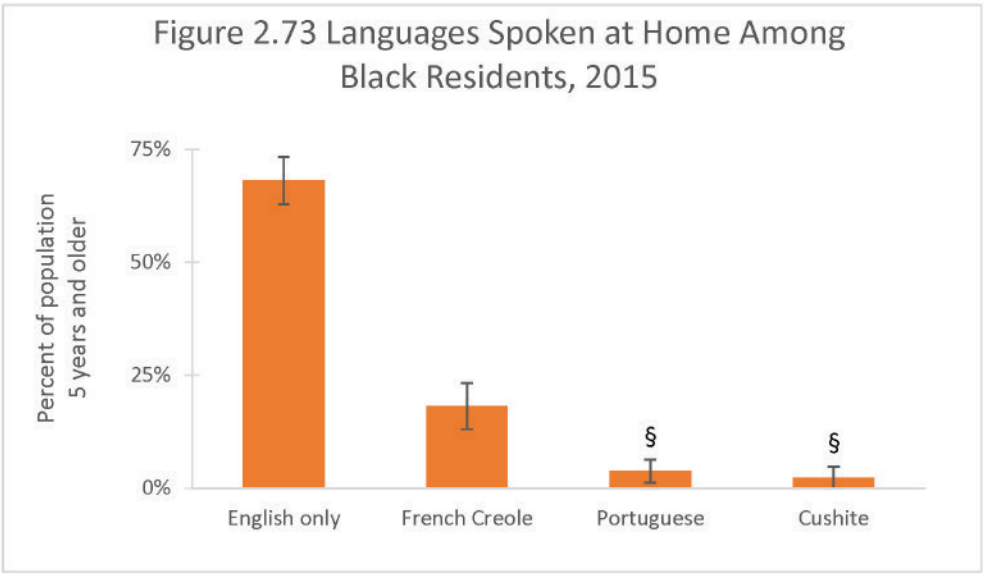
NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau



§ Estimates have a coefficient of variation greater than 30% and should be interpreted with caution.

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 39% of Black residents were of African-American ancestry. Additional reported ancestries included Haitian (14%), Cape Verdean (11%), Jamaican (7%), Black (6%), Africa (3%), Somali (3%), and Barbadian (2%).

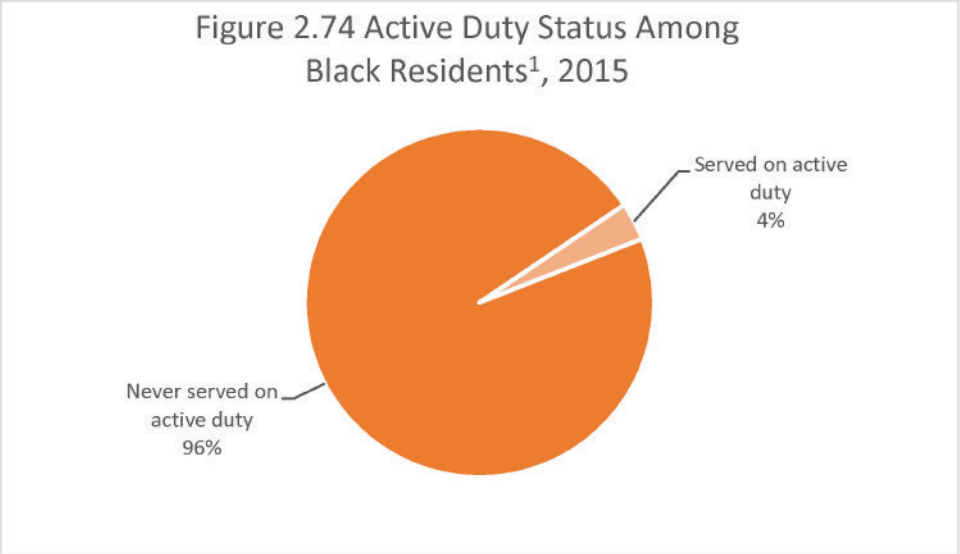


§ Estimates have a coefficient of variation greater than 30% and should be interpreted with caution.

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

English (68%) was the language most frequently spoken at home among Black residents ages 5 and older. Creole was spoken at home by 18% of residents, 4% spoke Portuguese, and 2% spoke Cushite.

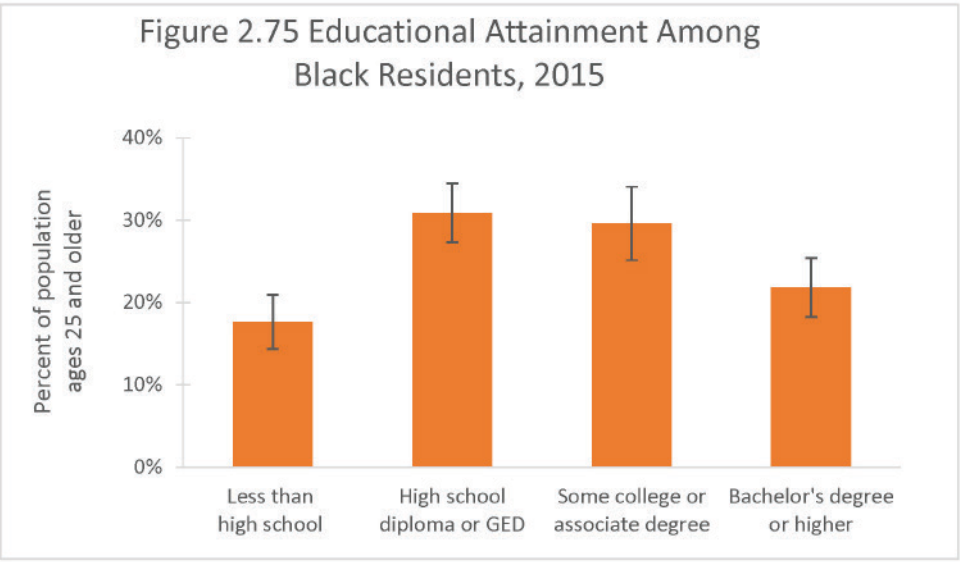
In 2015, approximately 4% of Black residents ages 17 and older had ever served on active duty in the military.



[1] Population ages 17 and older

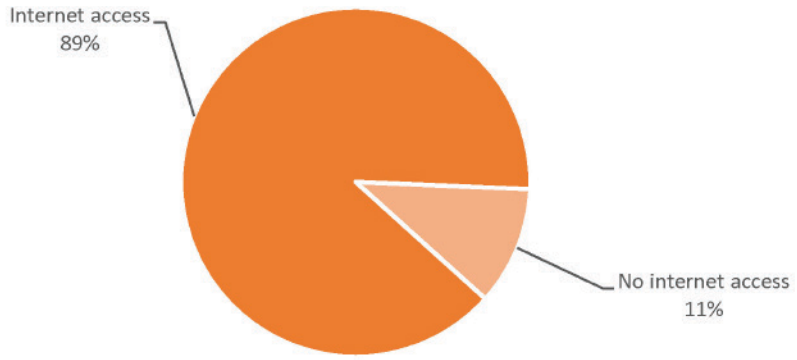
NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 18% of Black residents ages 25 and older had less than a high school diploma, 31% had a high school diploma or GED, 30% had some college education or an associate degree, and 22% had a bachelor's degree or higher.



DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

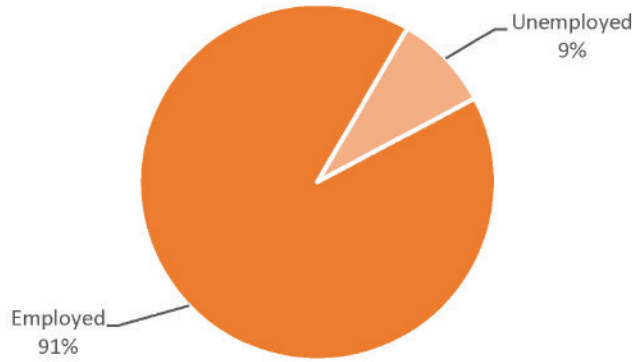
Figure 2.76 Internet Access Among Black Residents, 2015



NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 89% of Black residents had access to the internet at home.

Figure 2.77 Employment Among Black Residents[1], 2015

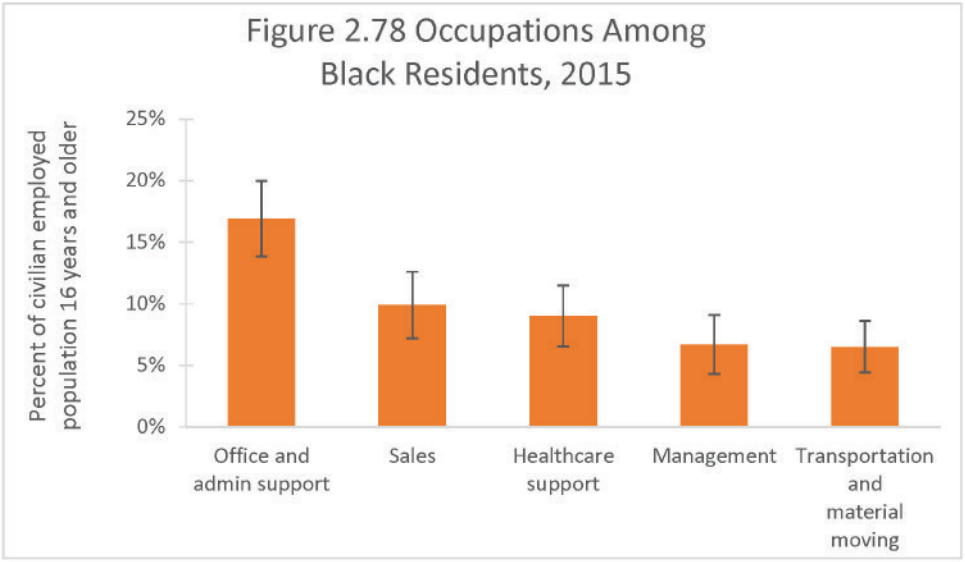


[1] Civilian population ages 16 and older in the labor force

NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

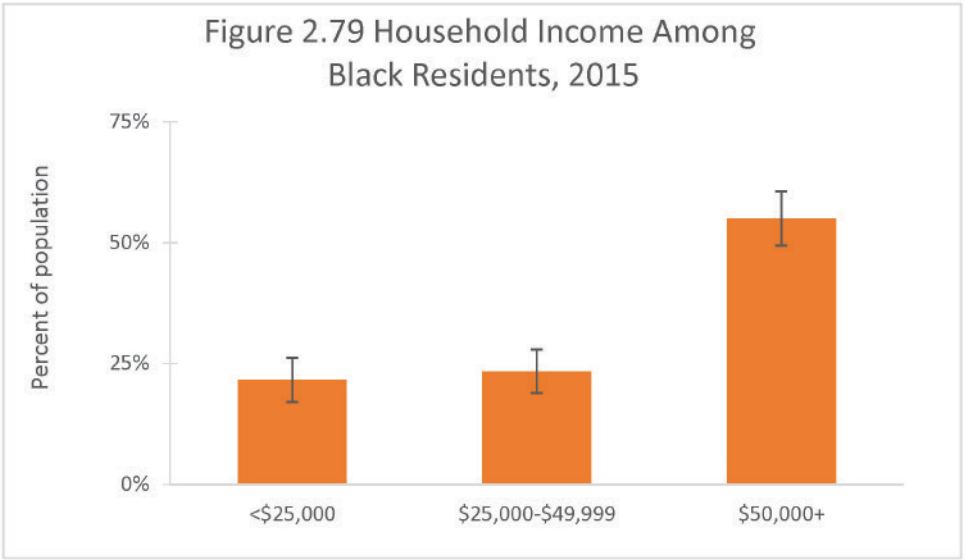
In 2015, 9% of Black residents ages 16 and older were unemployed.

In 2015, the most commonly held occupations among employed Black residents ages 16 and older were office and administrative support (17%), sales (10%), healthcare support (9%), management (7%), and transportation and material moving (7%).

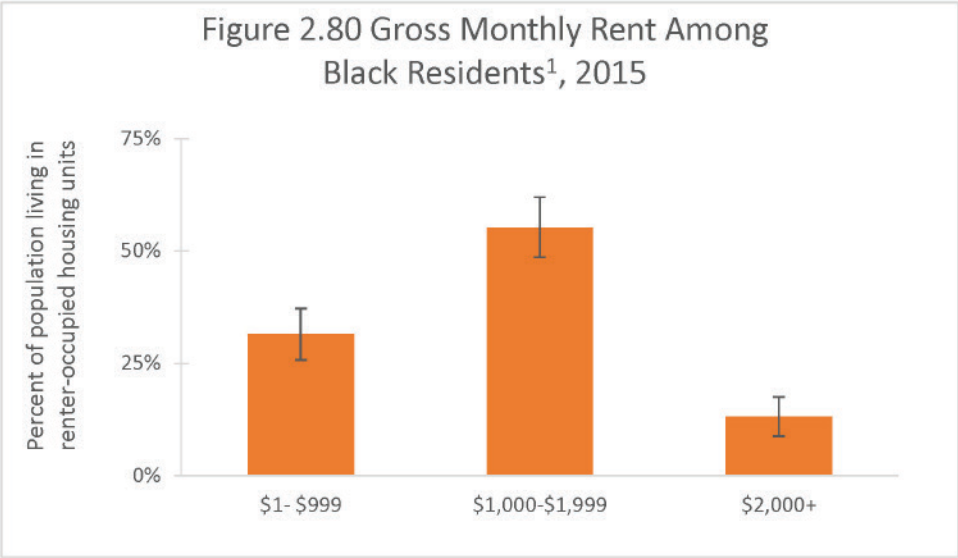


DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 55% of Black residents in Boston had a household income of $50,000 or more. Twenty-three percent had a household income of $25,000-$49,999 and 22% had a household income of less than $25,000.



DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau



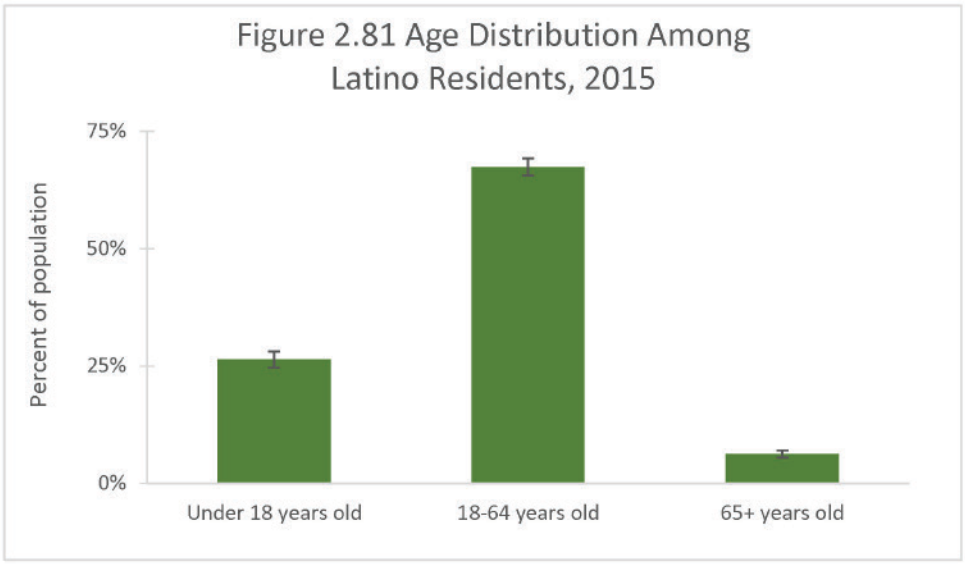
[1] Includes residents receiving governmental rental assistance

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 55% of Black residents living in renter-occupied housing units paid $1,000-$1,999 in gross monthly rent. Thirty-two percent paid $1-$999 in gross monthly rent and 13% paid $2,000 or more in gross monthly rent.

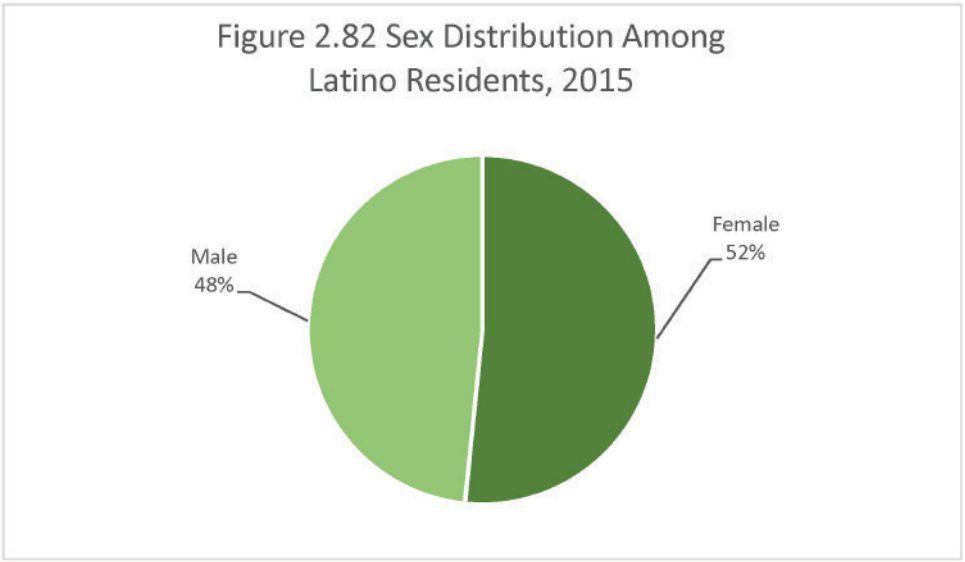
Latino Residents

In 2015, 26% of Latino residents were under 18, 67% were ages 18-64, and 6% were ages 65 and older.

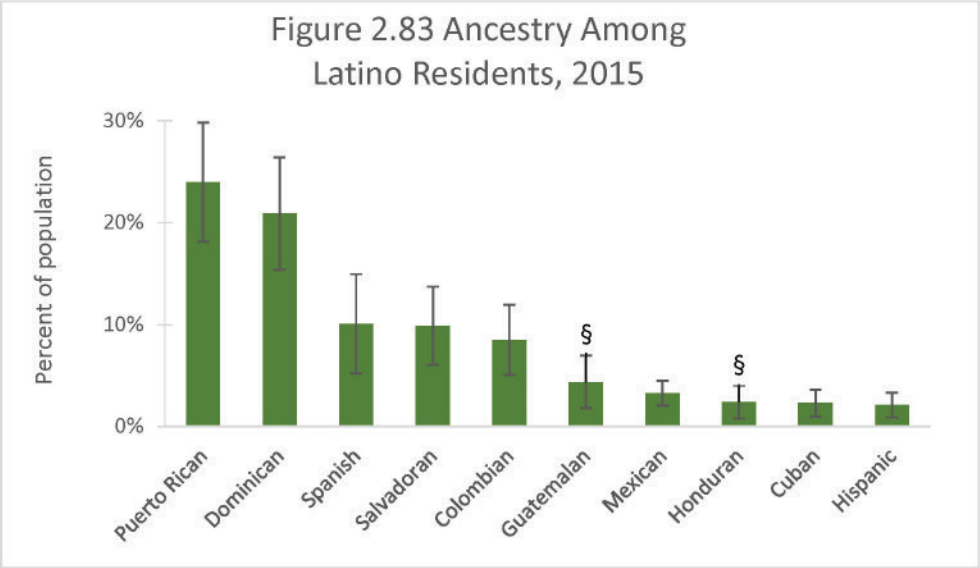


DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 52% of Latino residents were female and 48% were male.



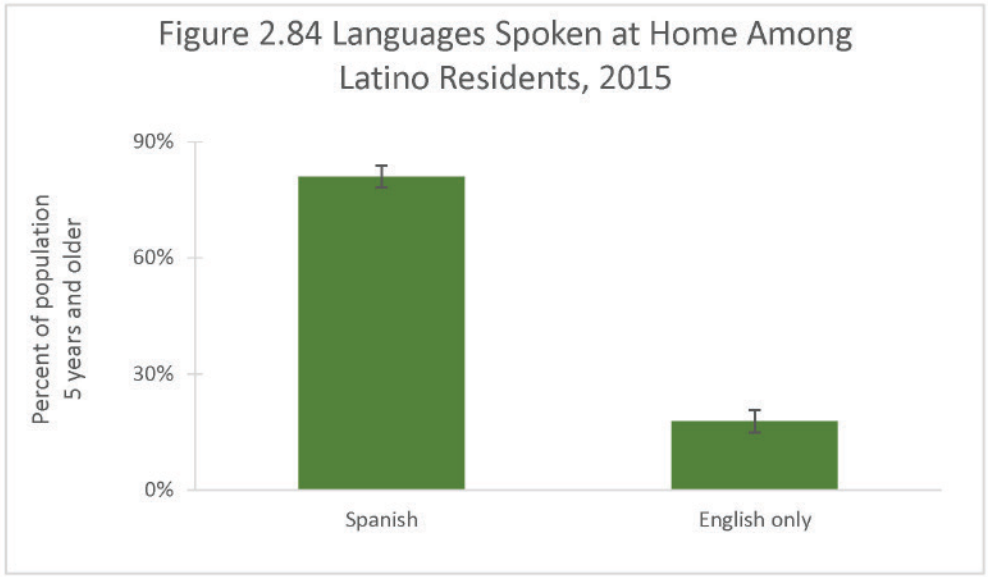
NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau



§ Estimates have a coefficient of variation greater than 30% and should be interpreted with caution.

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

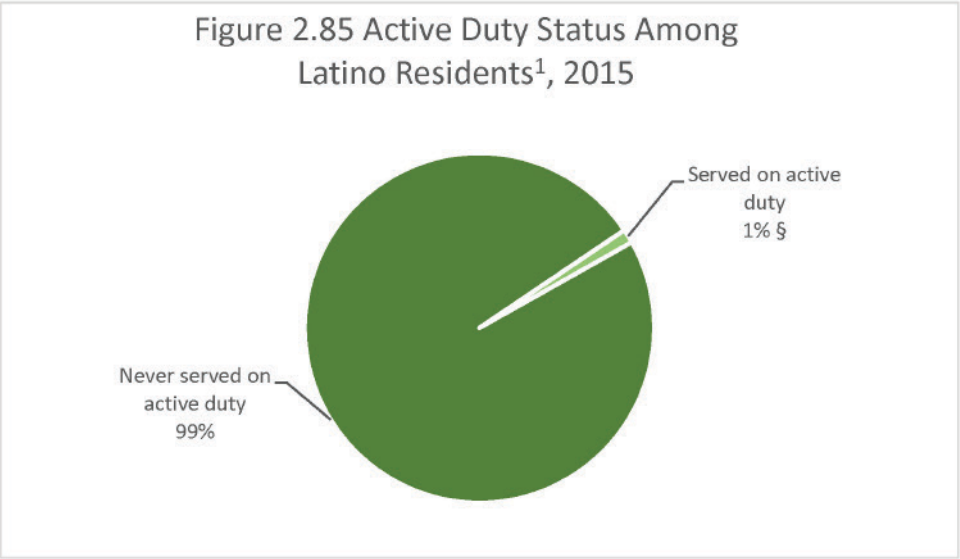
In 2015, 24% of Latino residents were of Puerto Rican ancestry and 21% were of Dominican ancestry. Other reported ancestries included Spanish (10%), Salvadoran (10%), Colombian (9%), Guatemalan (4%), Mexican (3%), Honduran (2%), Cuban (2%), and Hispanic (2%).



DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

Spanish (81%) was the language most frequently spoken at home among Latino residents ages 5 and older. Eighteen percent of Latino residents spoke only English at home.

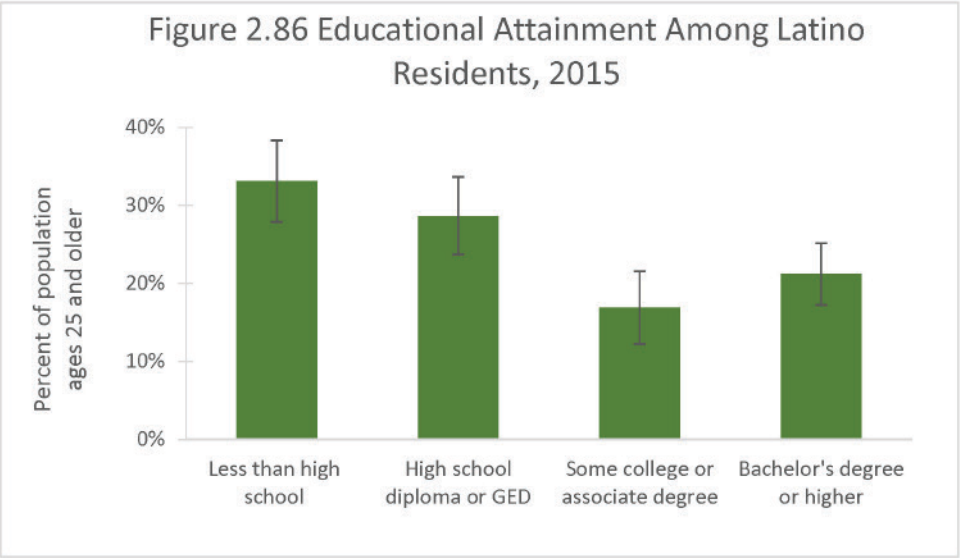
In 2015, approximately 1% of Latino residents ages 17 and older had ever served on active duty in the military.



§ Estimates have a coefficient of variation greater than 30% and should be interpreted with caution.
[1] Population ages 17 and older

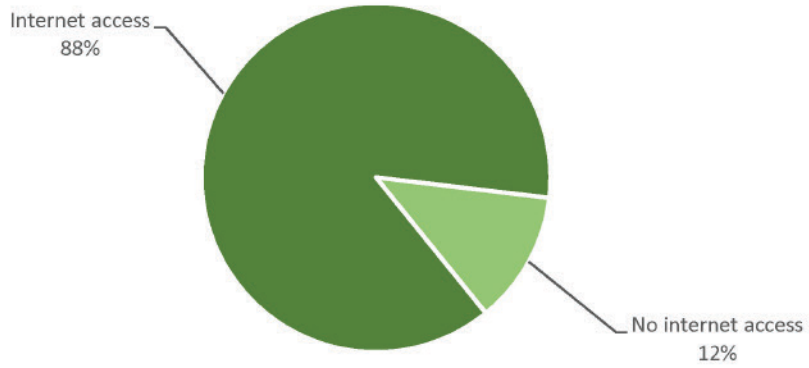
NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 33% of Latino residents ages 25 and older had less than a high school diploma, 29% had a high school diploma or GED, 17% had some college education or an associate degree, and 21% had a bachelor's degree or higher.



DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

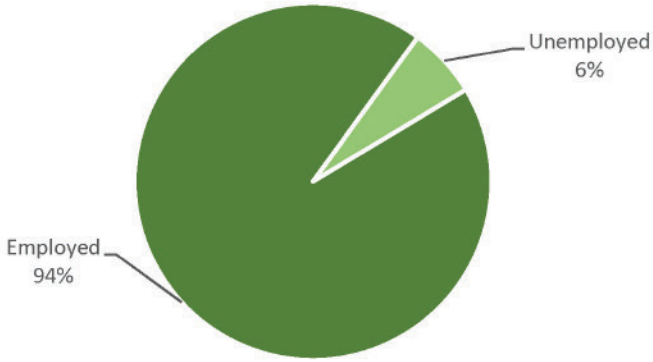
Figure 2.87 Internet Access Among Latino Residents, 2015



NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 88% of Latino residents had access to the internet at home.

Figure 2.88 Employment Among Latino Residents[1], 2015

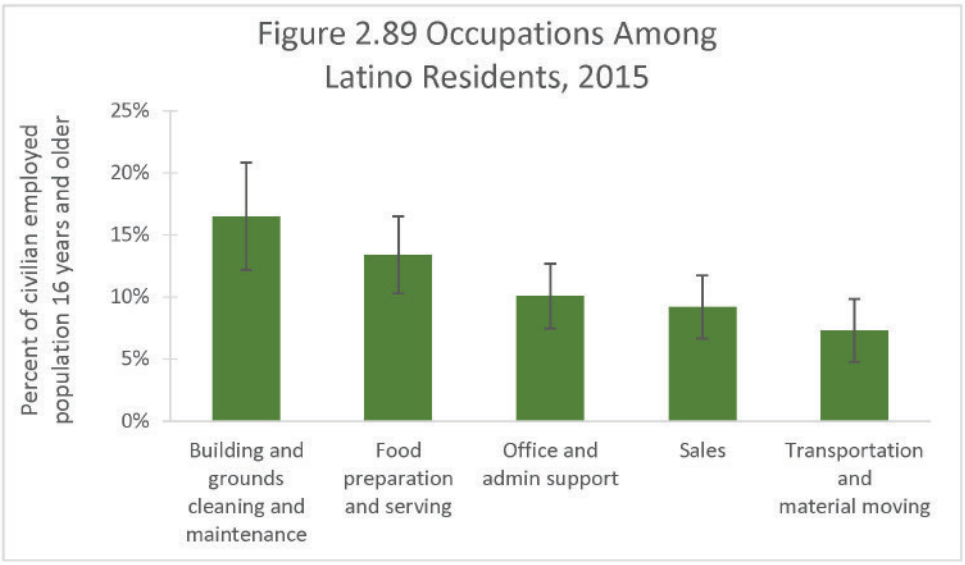


[1] Civilian population ages 16 and older in the labor force

NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

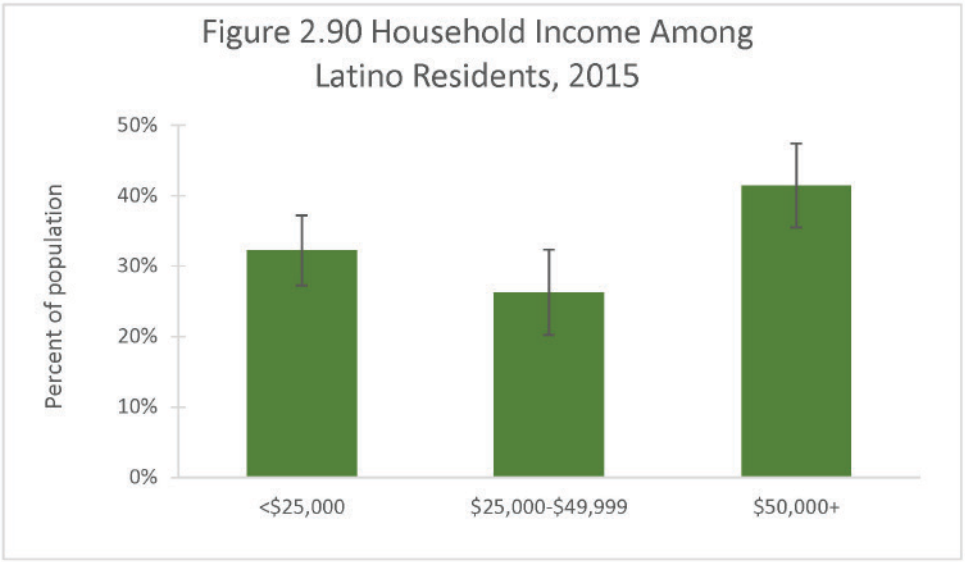
In 2015, 6% of Latino residents ages 16 and older were unemployed.

In 2015, the most commonly held occupations among employed Latino residents ages 16 and older were building and grounds cleaning and maintenance (17%), food preparation and serving (13%), office and administrative support (10%), sales (9%), and transportation and material moving (7%).

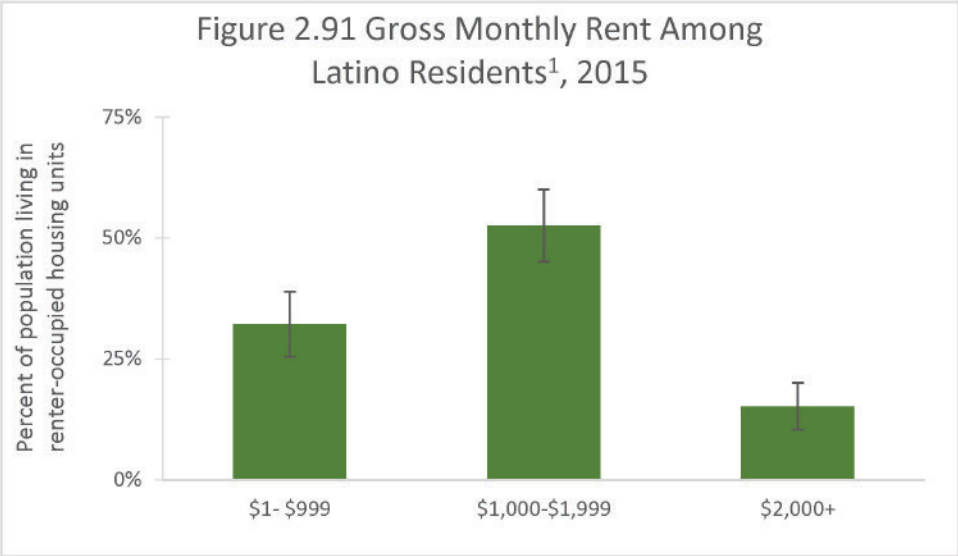


DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 42% of Latino residents in Boston had a household income of $50,000 or more. Thirty-two percent had a household income of less than $25,000 and 26% had a household income of $25,000-$49,999.



DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau



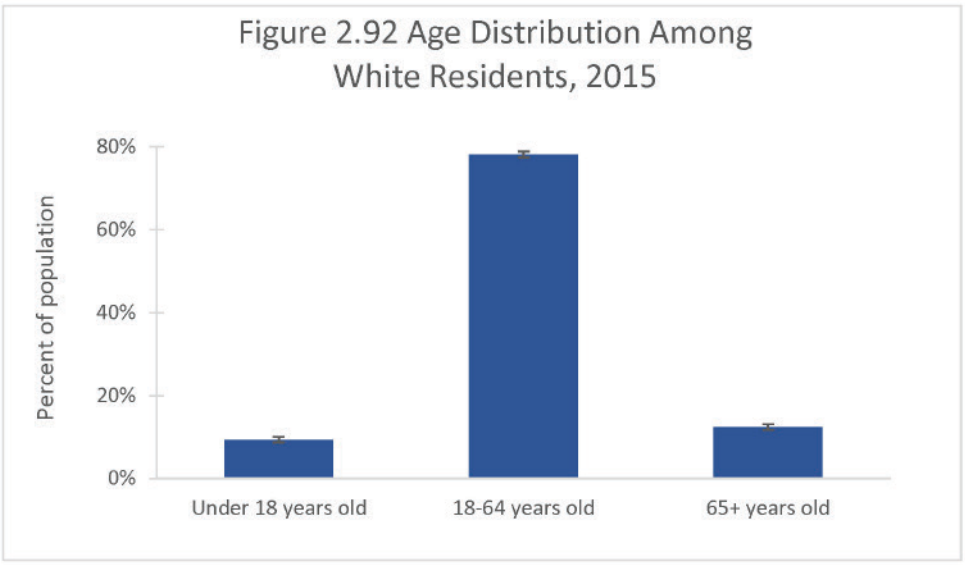
[1] Includes residents receiving governmental rental assistance

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 53% of Latino residents living in renter-occupied housing units paid $1,000-$1,999 in gross monthly rent. Thirty-two percent paid $1-$999 in gross monthly rent and 15% paid $2,000 or more in gross monthly rent.

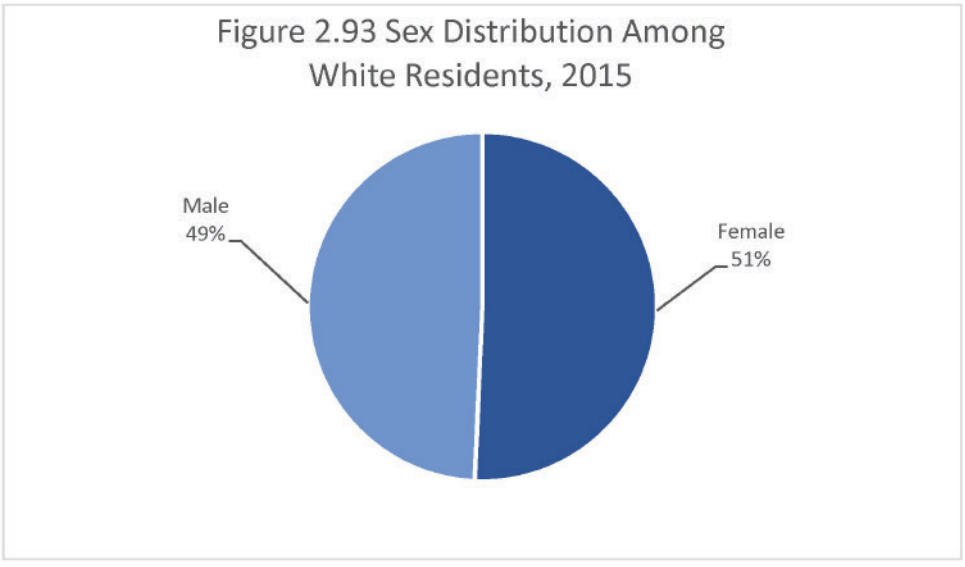
White Residents

In 2015, 9% of White residents were under 18, 78% were ages 18-64, and 12% were ages 65 and older.

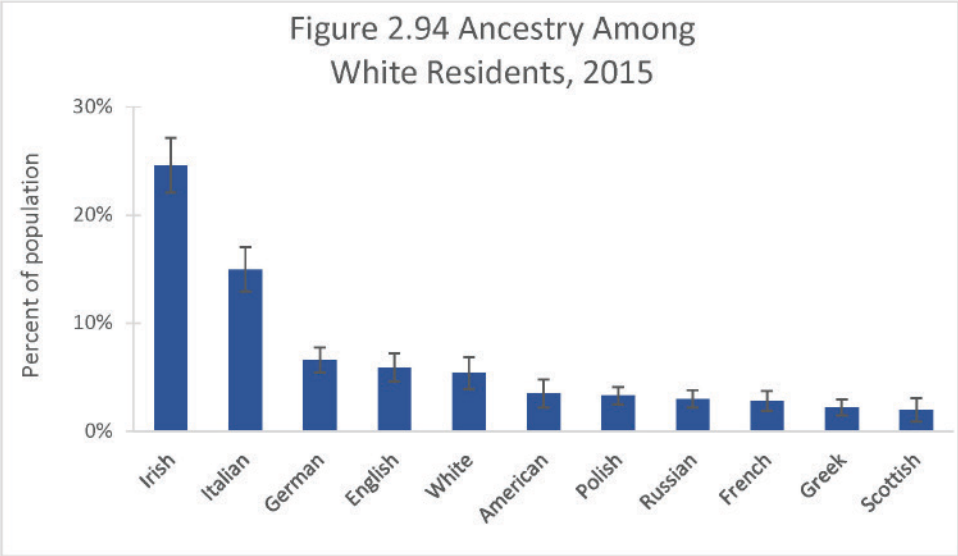


DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 51% of White residents were female and 49% were male.

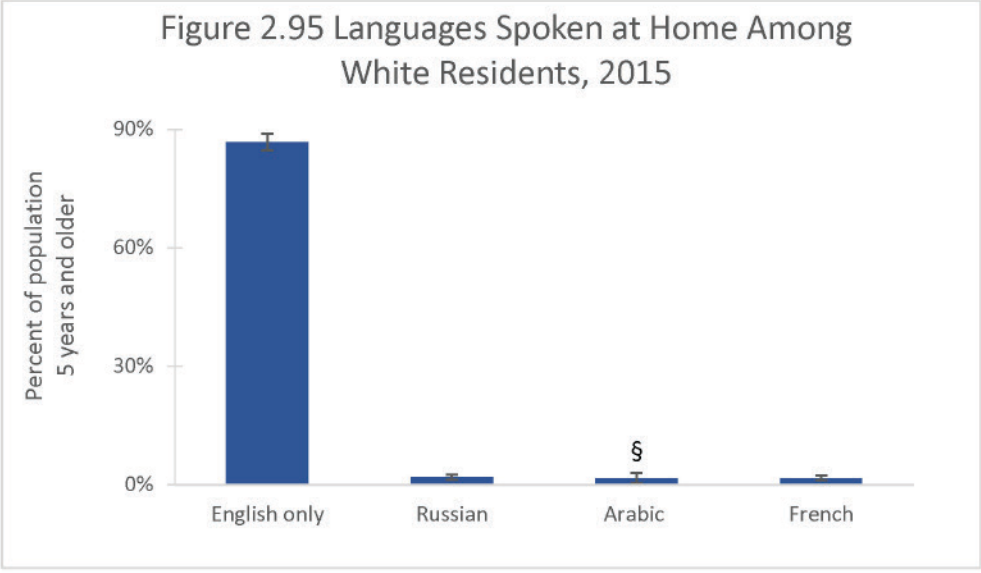


NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau



DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 25% of White residents were of Irish ancestry. Additional reported ancestries included Italian (15%), German (7%), English (6%), White (5%), American (4%), Polish (3%), Russian (3%), French (3%), Greek (2%), and Scottish (2%).

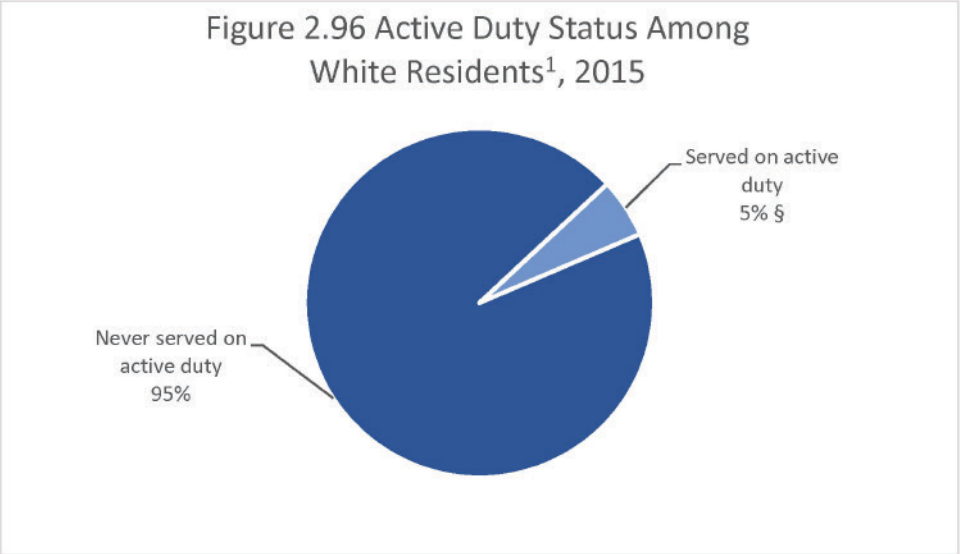


§ Estimates have a coefficient of variation greater than 30% and should be interpreted with caution.

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

English (87%) was the language most frequently spoken at home among White residents ages 5 and older. Russian, Arabic, and French were each spoken at home by 2% of residents.

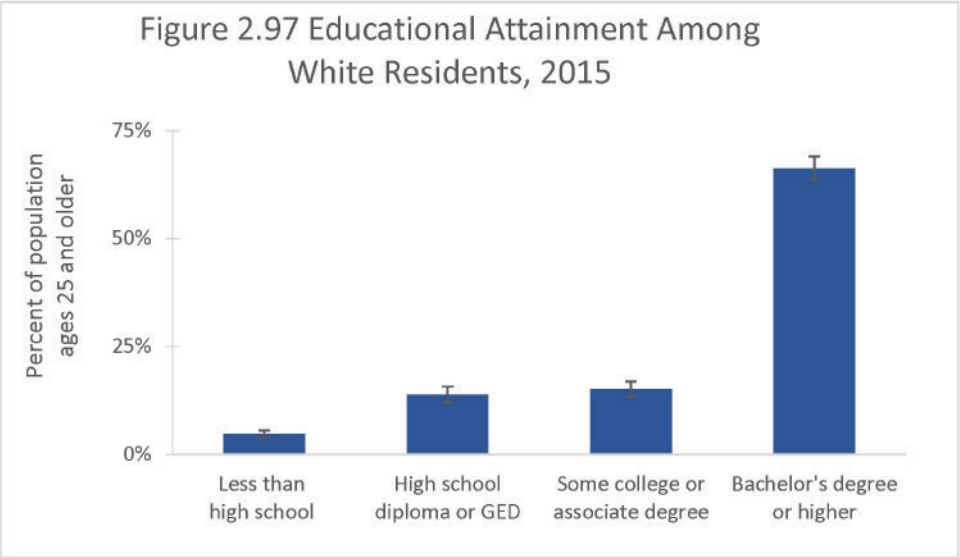
In 2015, approximately 5% of White residents ages 17 and older had ever served on active duty in the military.



§ Estimates have a coefficient of variation greater than 30% and should be interpreted with caution.
[1] Population ages 17 and older

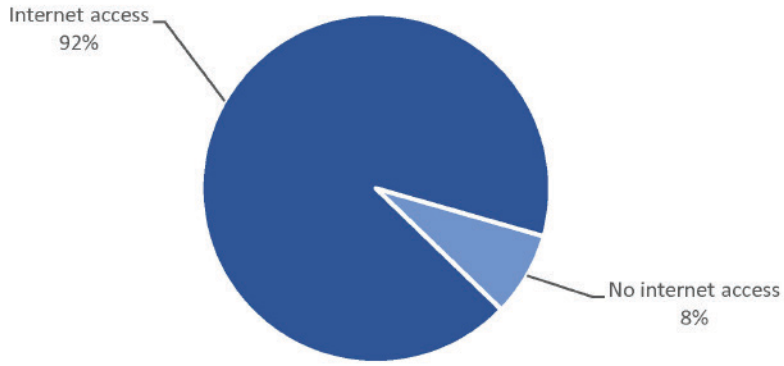
NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 5% of White residents ages 25 and older had less than a high school diploma, 14% had a high school diploma or GED, 15% had some college education or an associate degree, and 66% had a bachelor's degree or higher.



DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

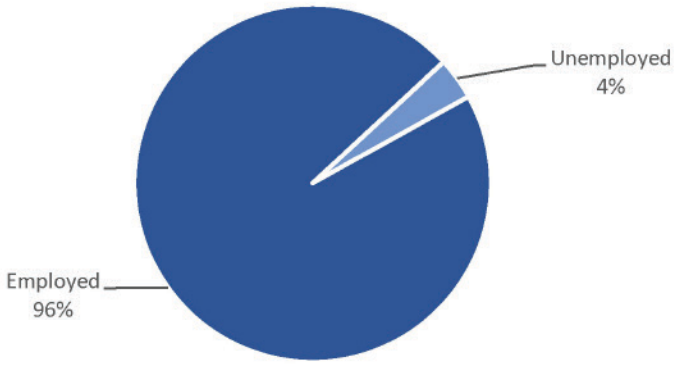
Figure 2.98 Internet Access Among White Residents, 2015



NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 92% of White residents had access to the internet at home.

Figure 2.99 Employment Among White Residents[1], 2015

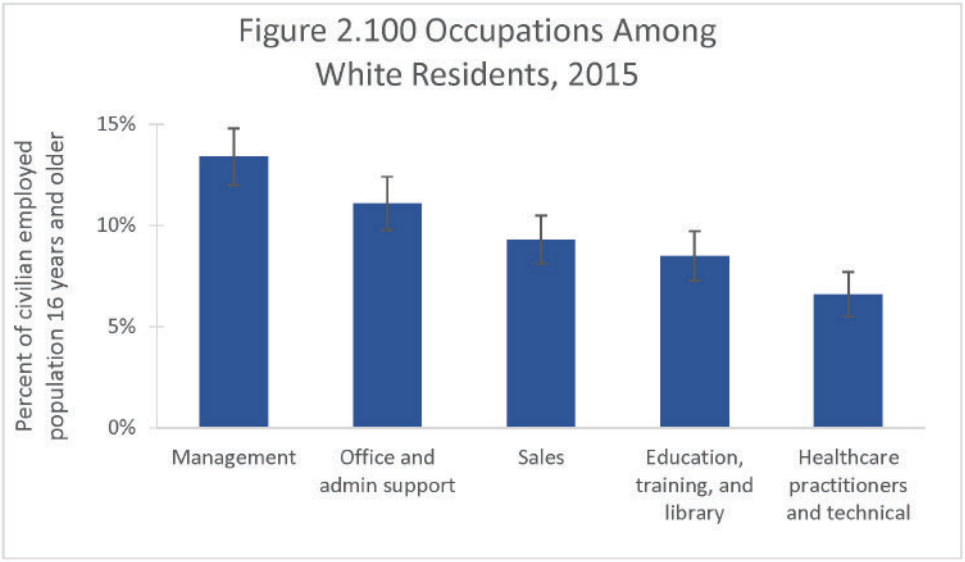


[1] Civilian population ages 16 and older in the labor force

NOTE: See appendix for confidence intervals for point estimates.
DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

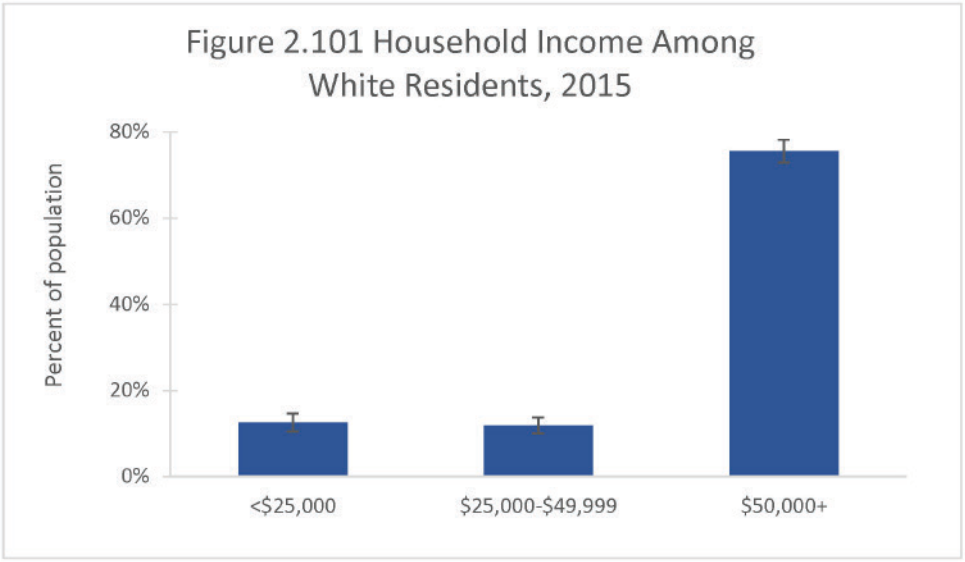
In 2015, 4% of White residents ages 16 and older were unemployed.

In 2015, the most commonly held occupations among employed White residents ages 16 and older were management (13%), office and administrative support (11%), sales (9%), education, training, and library (9%), and healthcare practitioners and technical occupations (7%).

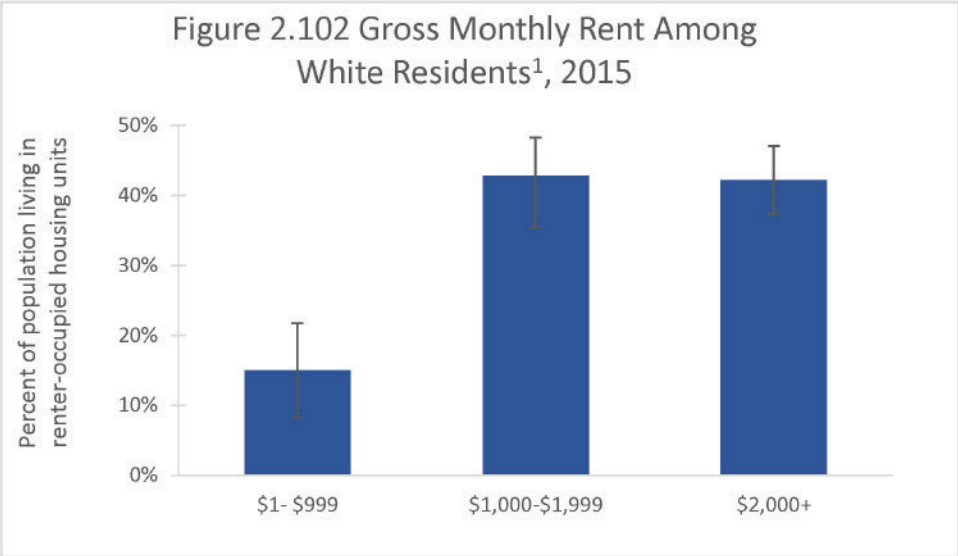


DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 76% of White residents in Boston had a household income of $50,000 or more. Thirteen percent had a household income of less than $25,000 and 12% had a household income of $25,000-$49,999.



DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau



[1] Includes residents receiving governmental rental assistance

DATA SOURCE: American Community Survey Public Use Microdata Sample, 2015, U.S. Census Bureau

In 2015, 43% of White households living in renter-occupied housing units paid $1,000-$1,999 in gross monthly rent. Forty-two percent paid $2,000 or more in gross monthly rent and 15% paid $1-$999 in gross monthly rent.

Overall Social Determinants of Health Summary

This chapter highlights how the social determinants of health influence specific health outcomes and provides an in-depth look at the social determinants of health by race/ethnicity. Many inequities emerge when we look at the social determinants of health by race/ethnicity, including educational attainment, employment status, household income, and housing. Poorer health outcomes are not a result of one's race/ethnicity. Rather, contrast, such outcomes have been linked to the impact of the social determinants of health. Social determinants influence our lives and experiences, and contribute to health inequities. Improvements to education quality and affordability, good paying jobs, and affordable housing, as well as eliminating racism's impact on these social determinants would narrow the health inequities and improve health outcomes for all residents.

Our Point of View: Thoughts from public health

Healthy and Affordable Housing is Essential for Good Health

By Margaret Reid
Director, Office of Health Equity
Boston Public Health Commission
And
Lourdes D. Lopez
Community Outreach Manager
Renew Boston Residential Energy Efficiency Program

The year 2016 brought us the news of the down side of Boston's booming economy and housing market: Boston is first in the country for income inequities [1] and third for rental costs [2]. Low incomes and housing challenges aren't affecting all of Boston's residents equally. In 2015, the median household income for Asian, Black, and Latino Boston residents was less than $42,000, compared with White residents whose median household income was more than $85,000.[3] Boston residents of color are also a higher percentage of renters, and bear a disproportionate burden of chronic disease.

Housing that is safe, healthy, and affordable is essential to good health. Affordability for the occupant can be more complex than rental or mortgage cost. Heating, transportation, and food costs contribute to a person's ability to stay in Boston. With older housing stock, heating costs can add up quickly and there is research demonstrating the relationship between housing insecurity, energy insecurity, and food insecurity, creating a perfect storm for poor health and homelessness.[4] Medical costs related to chronic health conditions can further exacerbate the situation.

Health in All Policies is a comprehensive approach to public policy that takes into account the health implications of decisions in all sectors in order to improve population health and health equity. A great example of this synergy is how the City of Boston Office of Environment, Energy and Open Space (EEOS) has prioritized energy efficiency in Boston's lower and middle income neighborhoods, many of which have a higher percentage of rental units and residents of color. Through its Renew Boston Program, the EEOS works closely with Mass Save, Eversource, National Grid, and ABCD to give financial incentives to owners and resources to renters to improve energy efficiency in their homes. Through multi-lingual mailings and community workshops, EEOS actively promotes these services to Boston residents who will benefit the most.

As policy makers, we need to embrace the *Health in All Policies* approach in any public policies that impact health. Health equity may not be the first thing on the minds of policy makers as they make difficult decisions about public transportation, neighborhood development, affordability requirements, or energy investments – but it should be high on the list.

[1] Berube A, Holmes N. City and metropolitan inequality on the rise driven by declining incomes. The Brookings Institution 1/14/2016. https://www.brookings.edu/research/city-and-metropolitan-inequality-on-the-rise-driven-by-declining-incomes/ accessed 1/20/2017.
[2] Glink Y. Top 10 priciest U.S. cities to rent and apartment. CBS News. 7/15/2013. http://www.cbsnews.com/media/top-10-priciest-us-cities-to-rent-an-apartment/ accessed on 1/20/2017.
[3] American Community Survey. 1 Year estimates, 2015. Median household income. U.S. Census Bureau.
[4] Hernandez D. Energy insecurity: a framework for understanding energy, the build environment, and health among vulnerable populations in the context of climate change. Am J Public Health. 2013 April. 103(4): e32-e34.

Our Point of View: Thoughts from a community resident

I Am an Advocate for Change

By Juell Frazier
Juell Frazier grew up in Roxbury and lives in Dorchester

My name is Juell. (Pronounced like a Jewel!) I have lived in Boston my whole life, grew up in Roxbury and now live in Dorchester with my two daughters. I am an advocate for change!

We have a Section 8 certificate. It took a really long time to get an apartment and I almost lost my certificate due to how long it took. Even with the certificate, I still have housing costs. I pay for gas for heat and our electricity and had to buy a refrigerator when we moved in. We go out to do the laundry.

My daughter is allergic to wheat, eggs, peanuts, and tree nuts. Gluten-free and wheat-free foods cost more. Her bread costs much more than bread with wheat in it. I have to go to multiple stores to buy healthy food and food she can eat. I used to live in Roxbury and was right near Dudley. It was much easier to get around. Everything was closer and I lived near the Orange Line and Dudley Station. If I don't have enough money, sometimes my girls and I have to do our grocery shopping and everything on foot. This is all starting to weigh on my own health.

I get discouraged, but I am a member of Witness to Hunger and it gave me support and the tools to tell my story. I started being able to advocate for myself and now I advocate for others; I testify and tell my story. I am trying to do the right thing for my children, myself and others in our situation.

Witness to Hunger is an advocacy organization. We go to monthly meetings and decide which issues we want to tackle. We work on federal policy issues and are starting to do more work in Boston and Massachusetts. We are working on changes with Department of Transitional Assistance and holding landlords accountable for safe and sanitary housing. I want to see change. I want to see people play fair for good working citizens. We should all be treated fairly.

References

1. Commission on the Social Determinents of Health. Closing the gap in a generation: health equity through action on the social determinants of health. Final Report on the Commission on Social Determinants of Health. Geneva; 2008.

2. Brennan Ramirez LK, Baker EA, Metzler M. Promoting Health Equity: A Resource to Help Communities Address Social Determinants of Health. Atlanta, GA: Centers for Disease Control and Prevention; 2008.

3. Kawachi I, Subramanian SV, Almeida-Filho N. A glossary for health inequalities. Journal of epidemiology and community health. 2002;56(9):647-52.

4. Adler NE, Newman. K. Socioeconomic Pathways in Health: Pathways and Policies. Health Affairs. 2002;21.

5. National Research Council and Institute of Medicine. Preventing mental, emotional, and behavioral disorders among young people: progress and possibilities. Washington, D.C.; 2009.

6. Seeman TE, et al. . Price of Adaptation—Allostatic Load and Its Health Consequences. Archives of Internal Medicine. 2007;Vol. 157:2259-68.

7. Steptoe A, Marmot M. The role of psychobiological pathways in socio-economic inequalities in cardiovascular disease risk. European Heart Journal. 2002;23.

8. Braveman P, Egerter S, Williams DR. The Social Determinants of Health: Coming of Age. Annual Review of Public Health. 2011;32.

9. Aboelata MJ. The Built Environment and Health: 11 Profiles of Neighborhood Transformation. Prevention Institute. 2004.

10. Daniel M, Moore S, Kestens Y. Framing the biosocial pathways underlying associations between place and cardiometabolic disease. Health & place. 2008;14(2):117–32.

11. Singh GK, Siahpush M, Kogan MD. Neighborhood Socioeconomic Conditions, Built Environments, And Childhood Obesity. Health Affairs 2010;20.

12. Komro KA. Creating Nurturing Environments: A Science-Based Framework for Promoting Child Health and Development within High-Poverty Neighborhoods. Clinical Family and Child Psychology Review. 2011;14.

13. Healthy People 2020. Social Determinents of Health: Overview: US Department of Health and Human Services; [01/25/17]. Available from: https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health.

14. Barnett E, Casper M. A Definition of "Social Environment". American journal of public health. 2001;91.

15. Ball Kea. Is healthy behavior contagious: associations of social norms with physical activity and healthy eating. International Journal of Behavioral Nutrition and Physical Activity. 2007;7.

16. Centers for Disease Control and Prevention. Frequently Asked Questions. Social Determinants of Health, 2014 [March 5, 2014]. Available from: http://www.cdc.gov/socialdeterminants/FAQ.html.

17. Murayama H, Fujiwara Y, Kawachi I. Social Capital and Health: A Review of Prospective Multilevel Studies. Journal of Epidemiology. 2012;22.

18. Nieminen T, et al. . Social capital, health behaviours and health: a population-based associational study. BMC public health. 2013;13.

19. Jackson JS, Knight KM, Rafferty JA. Race and Unhealthy Behaviors: Chronic Stress, the HPA Axis, and Physical and Mental Health Disparities Over the Life Course. . American journal of public health. 2010;100.

20. King K. Aggravating conditions: Cynical hostility and neighborhood ambient stressors. Social Science & Medicine. 2012;75.

21. Staff MC. Chronic stress puts your health at risk. Stress management 2014 [Marhc 5, 2014]. Available from: http://www.mayoclinic.org/healthy-living/stress-management/in-depth/stress/art-20046037?footprints=mine.

22. Folland S. Does 'Community Social Capital' Contribute to Population Health? Social Science & Medicine. 2007;64(11):2342-54.

23. Uphoff EP. A systematic review of the relationships between social capital and socioeconomic inequalities in health: a contribution to understanding the psychosocial pathway of health inequalities. International Journal of Equity in Health. 2012;12.

24. Cutler DM, Lieras-Muney A. Education and health: evaluating theories and evidence. . National Bureau of Economic Research. 2006.

25. Ross CE, Mirowsky J. Refining the Assocation between Education and Health: The Effects of Quantity, Credential, and Selectivity. Demography. 1993;36.

26. Leras-Muney A, Glied S. Health Inequality, Education and Medical Innovation. National Bureau of Economic Research. 2003.

27. Bloom B, Cohen RA, Freeman G. Summary Health Statistics for U.S. Children: National Health Interview Survey. National Center for Health Statistics. 2011;10.

28. Viswanath K., W. KM. Health Disparities, Communication Inequalities, and e-Health: A Commentary. American journal of preventive medicine. 2007:131-3.

29. Perrin A, Duggan M. Americans' Internet Access: 2000-2015. 2015.

30. American Time Use Survey – 2015 results [press release]. 2016.

31. Foundation RWJ. How does employment, or unemployment, affect health? . 2013.

32. Ross C. E., J. M. Does employment affect health? J Health Soc Behav. 1995:230-43.

33. Bureau of Labor Statistics, U.S. Department of Labor. Labor Force Statistics from the Current Population Survey [05/25/17]. Available from: https://www.bls.gov/web/empsit/cpseea38.htm.

34. Bureau of Labor Statistics, Department of Labor BoLS. Economic New Release: Table A-2. Employment status of the civilian population by race, sex, and age [05/25/17]. Available from: https://www.bls.gov/news.release/empsit.t02.htm.

35. City of Boston. Fiscal Year 2016 Adopted Budget: Boston's People and Economy. Boston, MA2016,.

36. Berube A, Holmes N. City and metropolitan inequality on the rise, driven by declining incomes. Washington, D.C.; 2016.

37. American Fact Finder. Selected Economic Characteristics, 2015 American Community Survey 1-Year Estimates. 2015.

38. Boston Public Health Commission. Health and Income: The Impact of Changes to Boston's Living Wage Ordinance on the Health of Living Wage Workers. Boston, MA: Boston Public Health Commission; 2016.

39. Saydah S, Lochner K. Socioeconomic status and risk of diabetes-related mortality in the U.S. Public Health Reports. 2010;125.

40. Krishnan S, Cozier YC, Rosenberg L, Palmer JR. Socioeconomic status and incidence of type 2 diabetes: results from the Black Women's Health Study. American journal of epidemiology. 2010;171(5):564-70.

41. Akinbami LJ, et al. Trends in Asthma Prevalence, Health Care Use, and Mortality in the United States, 2001–2010. National Center for Health Statistics. 2012.

42. Singh GK, Azuine RE, Siahpush M. Widening Socioeconomic, Racial, and Geographic Disparities in HIV/AIDS Mortality in the United States. Advances in Preventive Medicine. 2013.

43. Shacham E, et al. . Are Neighborhood Conditions Associated with HIV Management? . HIV Medicine. 2013;14.

44. American Fact Fider. U.S. Census Bureau. Selected Housing Characteristics 2015 American Community Survey 1-Year Estimates. 2015.

45. American Fact Fider. Gross Rent 2015 American Community Survey 1-Year Estimates. In: Bureau USC, editor. 2015.

46. Development DoN. Affordable housing in Boston. In: Boston Co, editor. Boston, MA2016.

47. Boston Housing Authority. FAQs for Applicants. In: City of Boston, editor. Boston, MA2017.

48. American Fact Finder. Gross Rent as a Percentage of Household Income in the Past 12 Months, Universe: Renter-occupied housing units, 2015 American Community Survey 1-Year Estimates. U.S. Census Bureau; 2015.

49. Anderson LM, Charles JS, Fullilove MT, Scrimshaw SC, Fielding JE, Normand J. Providing affordable family housing and reducing residential segregation by income. A systematic review. American journal of preventive medicine. 2003;24(3 Suppl):47-67.

50. Sampson RJ, Raudenbush SW, Earls F. Neighborhoods and violent crime: a multilevel study of collective efficacy. Science (New York, NY). 1997;277(5328):918-24.

51. Ross CE, Reynolds JR, Geis KJ. The contingent meaning of neighborhood stability for residents' psychological well-being. American Sociological Review. 200;65.

52. Coleman JS. Social Capital in the Creation of Human Capital. The American Journal of Sociology Supplement: Organizations and Institutions: Sociological and Economic Approaches to the Analysis of Social Structure. 1988;94:S95-120.

53. Munoz M, Crespo M, Perez-Santos E. Homelessness Effects on Men's and Women's Health. International Journal of Mental Health. 2006;34.

54. Hwang SW, Henderson MJ. Health Care Utilization in Homeless People. Agency for Healthcare Research and Quality. 2010.

55. Bharmel N, Derose KP, Felician M, Weden MM. Understanding the Upstream Social Determinants of Health Rand Corporation; 2015.

56. Centers for Disease Control and Prevention. Health Equity Atlanta, GA2015 [Available from: https://www.cdc.gov/chronicdisease/healthequity/index.htm.

57. Feagin J, Bennefield Z. Systematic racism and U.S. health care. Social Science & Medicine. 2014;103.

58. Roberts DE. Constructing a Criminal Justice System Free of Racial Bias: An Abolitionist Framework. New York, NY: Columbia University School of Law; 2008.

59. Fellner J. Race, Drugs, and Law Enforcement in the United States. Standford, CA: Standford School of Law; 2009.

60. Schulman KA, Berlin JA, Harless W, Kerner JF, Sistrunk S, Gersh BJ, et al. The effect of race and sex on physicians' recommendations for cardiac catheterization. The New England journal of medicine. 1999;340(8):618-26.

61. Alexander GC, Sehgal AR. Barriers to cadaveric renal transplantation among blacks, women, and the poor. Jama. 1998;280(13):1148-52.

62. Hausmann LR, Jeong K, Bost JE, Ibrahim SA. Perceived discrimination in health care and health status in a racially diverse sample. Medical care. 2008;46(9):905-14.

63. Williams DR, Mohammed SA. Racism and Health I: Pathways and Scientific Evidence. The American behavioral scientist. 2013;57(8).

64. Clark K, Clark M. Racial identification and preference among negro children. Readings in Social Psychology. 1947.

65. Davis K. A Girl Like Me. Reel Works Teen Filmmaking 2005. p. 7 minutes.

66. Pascoe EA, Smart Richman L. Perceived discrimination and health: a meta-analytic review. Psychological bulletin. 2009;135(4):531-54.

67. Chen AH, Youdelman MK, Brooks J. The legal framework for language access in healthcare settings: Title VI and beyond. Journal of general internal medicine. 2007;22 Suppl 2:362-7.

68. Todovora IL. Perceived discrimination, psychological distress and health. Sociology of Health and Illness. 2010;32.